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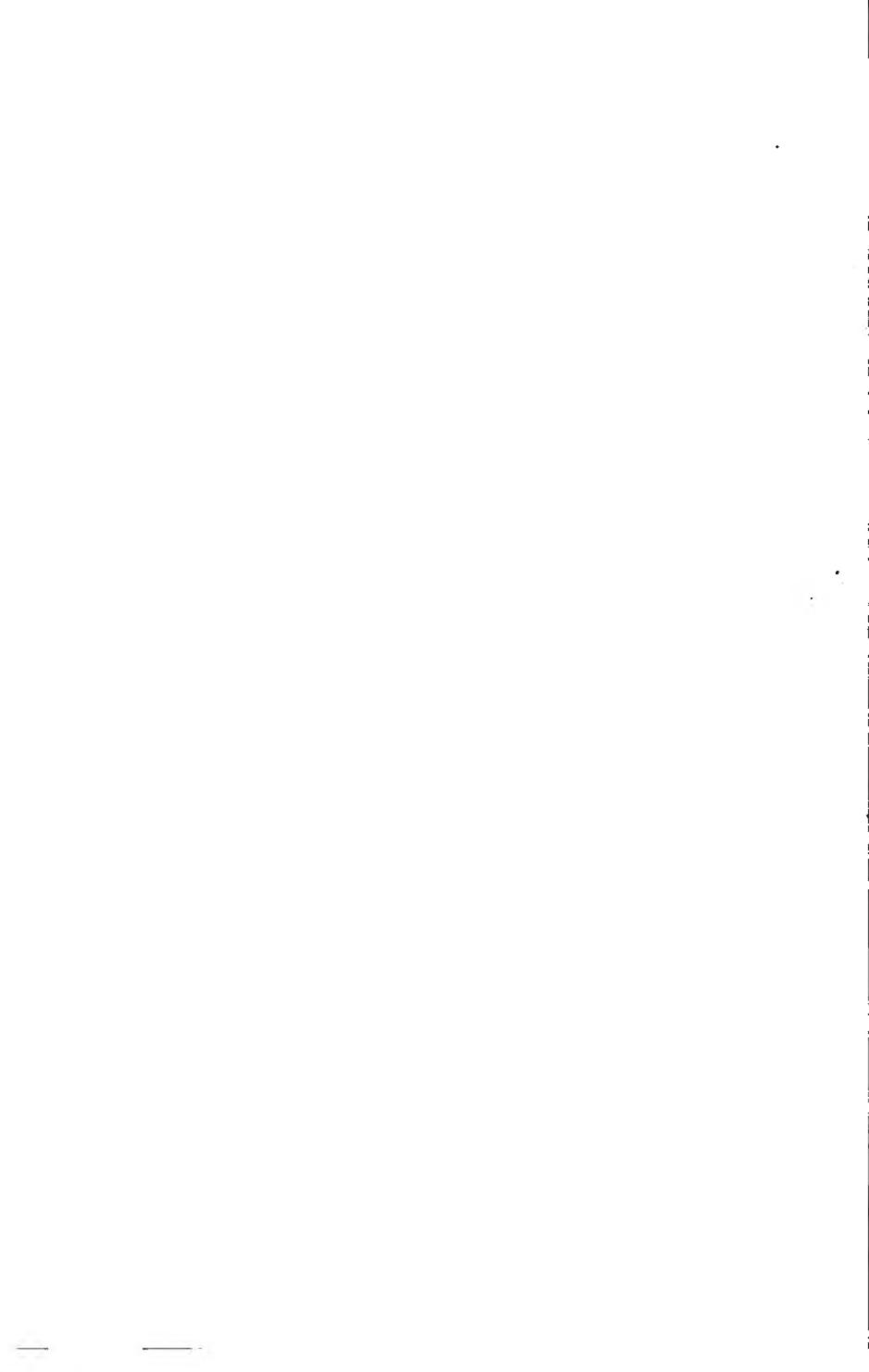
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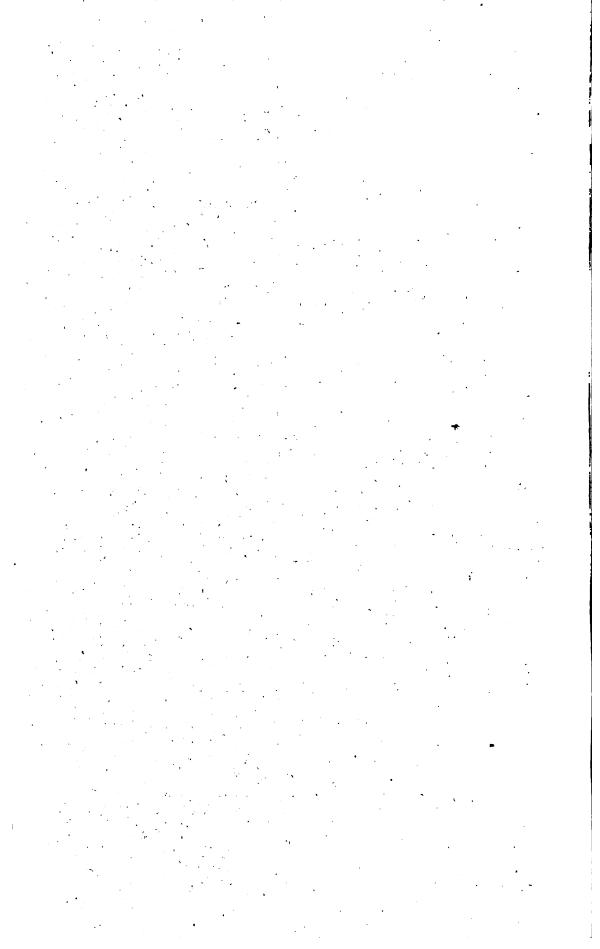




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REPORT ON THE PENSION FUNDS

OF THE

CITY OF NEW YORK

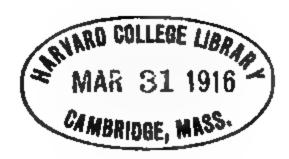
PART I

OPERATION OF THE NINE EXISTING PENSION FUNDS

City of New York

1916

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INTRODUCTION

This report is Part I of the final report on the investigation conducted for the Commission on Pensions under my direction. It contains a descriptive analysis of the existing nine pension plans now conducted for the benefit of city employees, in large part at public expense. The report calls attention to a condition of inequality in pension powers and extravagance of pension policies inevitably resulting from such haphazard and ill-considered legislation as has put into operation the present pension systems. The purpose of the report is, however, to present the facts for the consideration of the commission and the city authorities, city employees and the public generally, in order that a sound conclusion may be reached regarding pension reorganization so urgently needed.

Attention is especially directed to the information contained in the tables. There will be found cogent illustration of existing defects and suggestive facts helpful in clarifying proposals for reconstruction.

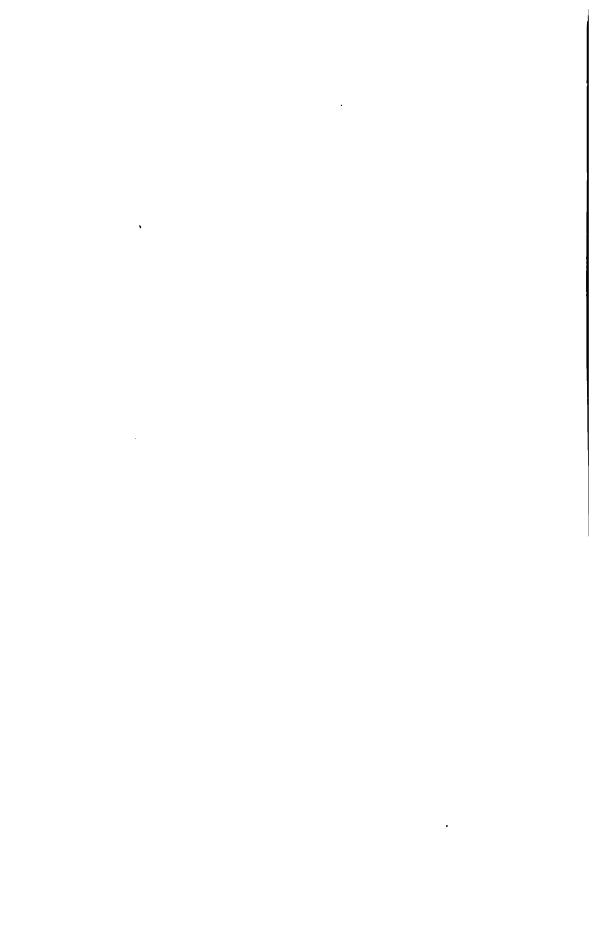
The present report is Part I of the final report of the Commission. Part II will present the results of the Commission's actuarial investigations of the existing funds, together with the valuation of future cost of continuing the plans now in force. Part III will outline, with argument and illustration, alternative plans for reconstructing the pension system (now systems) of the city on a sound financial and equitable basis. Part IV will present the actuarial calculations supporting the constructive recommendations, together with rates of contribution, etc.

Separate reports will be published on the present condition and past operation of all the individual pension plans now in operation, similar to the descriptive and critical parts of the special report on the Teachers' Retirement Fund already published.

I wish to acknowledge the services of Mr. Robert von Reutlinger of the Commission's staff in the preparation of this report.

It is very earnestly desired that all parties concerned, and especially employees having the interest of the public service generally at heart, will give careful thought to the facts presented herein, in order that the Commission on Pensions may have the benefit of matured suggestions in framing its constructive recommendations.

HENRY BRUÈRE, Vice-Chairman and Secretary, Mayor's Commission on Pensions.



New York, February 17, 1916.

To the Commission on Pensions, CITY OF NEW YORK.

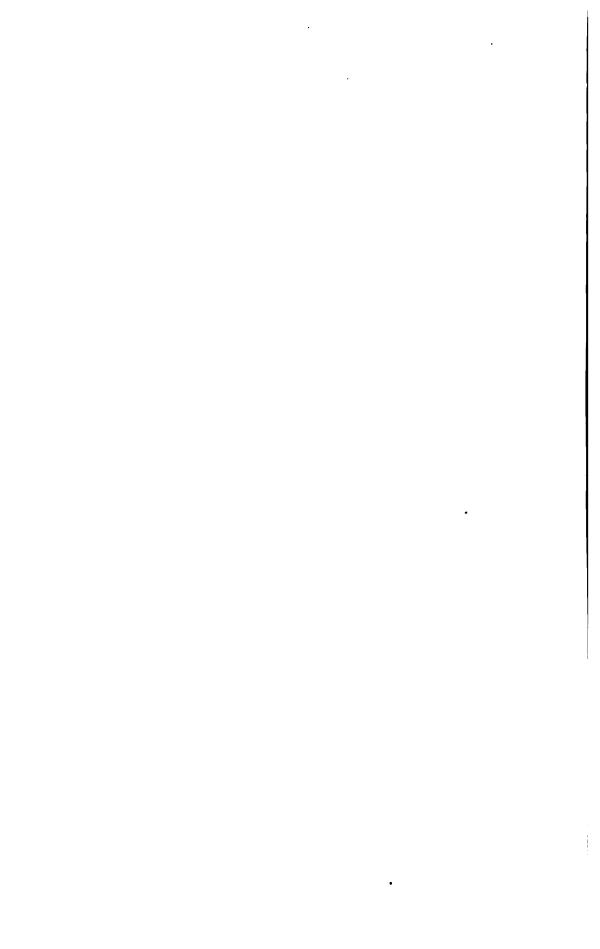
GENTLEMEN:

I beg herewith to submit a summary report on the nine active pension plans in operation in the government of the city of New York. This report constitutes Part I of the final report of the investigations which the Commission directed me to make. Three additional parts will be submitted in order.

Respectfully submitted,
HENRY BRUÈRE,
Vice-Chairman and Secretary.

Mr. George W. Perkins, Chairman.

Frank H. Bethell John A. Bolles Raynal C. Bolling John H. Boschen William H. Chorosh Mrs. F. H. Cothren Albert de Roode Frank L. Dowling August Ferrand Joseph Haag Louis H. Hahlo Francis D. Pollak Arthur Williams S. Herbert Wolfe



CHAPTER I

DEVELOPMENT AND SCOPE OF PENSION FUNDS

Funds Developed on Initiative of Employees

The most ineffective and expensive way of dealing with superannuated and incapacitated employees is to place dependence on enforced reductions and dismissals of the incapacitated, on the basis of efficiency ratings or for other causes, rather than on the basis of a sound pension system.

Employees cannot be regulated in the same manner as machinery, and efficiency methods which fail to take into account the demands of human nature will invariably prove unsuccessful. A too strict application of efficiency requirements with no provision for the care of the superannuated forfeits the goodwill of employees and results in indifferent work and unstable service. On the other hand, the omission of all safeguards for the integrity of the service results in the retention on full pay of the aged and infirm, and the consequent blocking of promotion of younger employees who either have to stifle ambition or seek employment where better conditions prevail. This means demoralization of the service and, although it is impossible to measure the effect in dollars and cents, represents the most important reason for the adoption of a sound system of retirement allowances.

It must be understood that the need of a retirement system is not peculiar to any particular group of employees, but applies to the entire service. In the interest, therefore, of efficiency and equal justice, the city's attitude toward employees in all departments under like conditions should be one of strict impartiality. To obtain this result will require official initiative and guidance in the formulation of a sound pension policy.

In the development of the present pension plans for New York City employees, initiative was taken by those immediately to be benefited, the government maintaining an attitude of indifference. Groups of employees strongest in organization, with sentiment and politics coöperating, secured liberal pension legislation, while the employees of smaller departments, whose activities were less in the public eye, had to be content with less favorable provisions.

Provision for accidents in performance of duty nucleus of present system

The origin of the city's pension systems dates back as far as 1857, when the legislature established a fund for the relief of policemen injured in the performance of duty, and for their dependents in case such injury resulted in death. Recognition of the city's obligation for accidents in the performance of hazardous duty was also the basis of the establishment of the pension fund for firemen in 1866, after the creation of a paid fire department in 1865.

¹ The original pension law for firemen was passed in 1866. It was inoperative, however, until 1871, when the fund began to make its first payments.

In both funds the initial provision was the payment, in case of accidental death, of a lump sum of \$2,000 to the estate of the deceased employee. A lump sum of \$1,000 was provided for permanently disabled policemen, while the permanently disabled firemen received a pension of \$240 per annum.

In the subsequent development of the funds of the police and fire departments, the lump sum benefits were replaced by pensions originally fixed at \$150 per annum, later changed to \$300 per annum, and finally increased to ½ of final salary for disabled firemen and ¼ to ½ of final salary for disabled policemen. The pensions to widows and children were increased from the original \$150 per annum to the present maximum of \$600 in the police pension fund, and to not exceeding ½ of final salary 1 of the deceased fireman. Dependent parents of firemen were made eligible to benefits in 1896, while dependent parents of policemen became beneficiaries in the police pension scheme in 1907.

Liberalization of police and firemen's pensions encouraged introduction of teachers' and health officers' pensions in 1894

The liberalization of the provisions of the police and fire funds was not restricted to pensions granted in cases of injury and death in the performance of duty. The principle of retirement for disability not incurred in the performance of duty was established in the police pension fund in 1867 and in the fire department pension fund in 1877. Retirement on application after 20 years' service, without proof of incapacity, was first allowed to policemen in 1878 and to firemen in 1894. Pensions to dependents of policemen and firemen were also liberalized. In 1864, widows and children of policemen were made eligible to benefits in case of death in active service, though not resulting from performance of duty. In 1871, dependents of firemen were likewise benefited. In 1879, the practice was introduced of continuing pensions of deceased firemen at reduced amounts to their widows and children. A similar provision was adopted by the police pension fund in 1882.

The provisions made for contingencies which do not arise directly as the result of the hazardous occupation of policemen and firemen, and are, therefore, applicable to any city employee, supplied precedents for the establishment of pension funds in other branches of the service. The employees of the health department were the first to profit. Their pension fund was established in 1894. Pension legislation for Manhattan teachers was passed in 1894, and for Brooklyn teachers in 1895,—the two pension funds being consolidated in 1901.

Precedents established helped employees to effect city-wide pension system

General development of pension policies for policemen, firemen and teachers, as well as for employees in private corporations, began early in this century and has continued at an accelerating rate during the last few years.

¹ Not exceeding \$1,000 in the case of the widow, and not exceeding \$500 for each child.

Employees in other branches of the city's service realized their opportunity. Aided by the example of local precedents and similar developments in other cities, the teaching staff of the College of the City of New York secured the establishment of a pension fund in 1902. In 1905, a law was passed for the retirement for disability after 30 years' service, of employees of the department of finance, and the first beneficiary, a bookkeeper of the chamberlain's office, for whose benefit the law was drafted, retired on January 1, 1906. This law was subsequently amended in 1911 and, known as the "Grady Law," extended its benefits to all city employees not provided for by existing pension funds.

The employees of the street cleaning department, after several years of agitation, secured the passage of a bill for their retirement under special provisions in 1911. In the same year a pension fund was established for the employees of the Supreme Court, First Department, and in 1913 the retirement provisions for the employees of the Supreme Court, Second Department, were enacted as the latest addition to the then existing eight municipal pension plans.

The development of the city's pension system was not limited to the enactment of laws for the establishment of the various funds. Increases in the original benefit scales, the liberalizing of conditions for eligibility to pension, and the extension of benefits to new classes of beneficiaries were the main objects of numerous legislative amendments. The additional burdens so imposed on the funds were counterbalanced only in a slight degree by legal provisions requiring contributions to the funds from prospective beneficiaries. The policemen were first required to contribute 2% of salary in 1893, the teachers of Brooklyn contributed 1% of salary during the period from 1896 to 1901. Since 1905 such contributions have been required of all teachers. The health department employees have contributed 1% of salary since 1907, the street cleaners 3% of salary since 1911, and the employees of the Supreme Court, First Department, 1% of salary since 1913.

Due to this fitful and unsystematic development, the present pension laws regulating the benefits and income of the various funds present a tangled mass of conflicting provisions. To facilitate a general perspective, their main features as well as statistics indicative of the scope of each of the present nine pension funds are presented in a comparative statement opposite page 4.

More than one-half of service covered by special provisions

A study of this statement brings out the fact that the special departmental pension funds confer on the majority of city employees exceptional privileges, such as retirement after 20 to 30 years of service without proof of disability, retirement for disability occurring after short periods of service, and pensions to dependents of employees who die while in service and of deceased pensioners. These privileges are not enjoyed as yet by the employees covered by the general provisions of the "Grady Law," which

require proof of incapacitating disability as well as 30 years of service for eligibility to retirement.

Employees in the active service who are covered by the provisions of the nine pension funds are grouped by titles and annual compensation and form the subject matter of Tables 1 to 9, pages 88 to 103. A summary of the number of employees, average salary and total annual salary is presented as follows:

	Number in Active Service	Average Annual Salary	Total Annual Salary
Special Departmental Pension Funds: Police Pension Fund	21,317 1,256 223 5,474	\$1,405.04 1,503.78 1,420.66 1,040.18 2,275.78 835.35	\$15,045,210.00 7,524,900.00 30,284,217.00 1,306,464.00 507,500.00 4,572,686.50
Supreme Court, First Dept., Retirement Fund . Supreme Court, Second Dept., Retirement Fund Total	295 177 44,454	2,317.46 2,249.44 \$1,356.97	\$60,322,778.73
General, City of New York Employees' ("Grady") Retirement Fund: Mechanics Laborers, Men. Laborers, Women. Clerks, Men. Clerks, Women. Exempt Employees.	6,064 10,841 1,174 9,745 2,532	\$1,494.01 779.43 380.69 1,332.62 866.74 1,796.33	\$9,059,650.00 8,449,750.00 446,930.00 12,986,380.00 2,194,590.00 4,490,830.00
Total		\$1,145.24 \$1,266.99	\$37,628,130.00 \$97,950,908.73

¹ The figures for the special pension funds apply to the active force as of December 31, 1914, with the exception of the Teachers' Retirement Fund indicating the active teaching force as of May 31, 1915.

As shown above, 44,454 employees, or 57.5%, of the total municipal service numbering 77,310 men and women, are subject to the more liberal provisions of the city's pension systems. It must be observed that on the whole their compensation for active service, as indicated by the average annual salary of \$1,356.97, is more favorable than the pay received by the 32,856 employees covered by the comparatively stringent provisions of the "Grady Law," the corresponding average being \$1,145.24 per annum. The only exceptions in the former group are the street cleaners, whose average annual pay is \$835.35. It must be pointed out, however, that the granting of special pension provisions to these employees took place after long and continuous agitation on their part, and after submitting to a deduction of

² Employees covered by the provisions of this fund do not include appointive and elective officers nor temporary employees whose chances for eventual retirement are remote and improbable. The figures show the status of the force on June 30, 1914.

epartment of Street leaving Relief and Pension Fund	Supreme Court, First Department, Retirement Fund	Second Department, Retirement Fund	Total, All Funds
1911	1911	1914	
mum, ½ final pay er 20 years' service, years of age	34 of average last 2 years' pay after 25 years' service	No provision	
60	48		
mum, ½ final pay er 10 years' service	Maximum, ½ of average last 2 years' pay after 20 years' service	Maximum, ½ of average last 2 years' pay after 25 years' service	
after less than 10 are' service mum, 14 pay after years' service	Same as "ordinary" dis- ability	Same as "ordinary" dis- ability	• • • • • • • • • • • • • • • • • • • •
		.v	
00 to widow or children by time; \$300 to widow,	No provision No provision	No provision No provision	
ndent parent			
to widow or emidren	No provision	No provision	
	1%	None	
rovision	Appropriations as required	Appropriations as required	
rpended balance of sal- y appropriations eys for privilege of ow trimming or assort- g of refuse eys for sale of ashes, rbage and refuse	Unexpended balances of salary appropriations	None	•••••••••••
iplinary and absence de- ictions from employees departmental operty emption and sale of in- mbrances			
ations, interest	Interest	Nome	
5,474 484 8.84% \$4,667,298.06 \$163,063.71 3.49%	295 11 3.73% \$008,656.00 \$10,822.80 1.78%	177 1 .56% \$399,448.91 \$000.00 .28%	77,310° 8,232 10,65% \$104,965,059,00° \$5,053,167,34 4.80%
\$428,714.53 829,362.72	\$9,298.51 22,068.25		\$7,849,058.18
829,362.72 48,853.50	22,068.25 78.80	\$900.00	50,101,416.70 2,577,797.63
\$1,306,930.75	\$81,445.56	\$900.00	\$60,028,272.45
\$293,032.07 7,598.51	\$22,068.25	\$900.00	\$56,783,095.94 183,280.95
\$300,630.58	\$22,008.25	\$900.00	\$56,916,876.89
\$1,006,300.17	\$9,877.81	None	\$3,111,896.56

	·		

3% of salary for the benefit of their fund, which is the largest contribution exacted from any city employee.

Another feature, showing that present pension laws have disregarded principles of impartiality, is presented by the inclusion of employees engaged in non-hazardous occupations in groups eligible to extra-liberal pension benefits on account of exposure to danger and inclement weather in the line of The clerical employees of the street cleaning department fund, as shown in Table 7, page 98, are entitled to the same provisions as the rank and file of street cleaners. In the health department (see Table 4), eligibility to the extremely liberal benefits of the pension fund is not restricted to employees who are exposed to possible danger from infectious diseases, but is extended to any employee agreeing to contribute 1% of salary. Thus, clerks, bookkeepers, laborers, etc., who do identically the same kind of work as is done in other departments covered by the 30-year disability provision of the "Grady Law," may on application leave the service in the best of health on a life income of ½ of salary after 20 years of service. In the police pension fund, the inclusion of surgeons not subjected to exposure and the hazards of the policeman's work presents another instance of ill-considered pension legislation. The most striking example of discriminating generosity, however, is the clause in the police pension law entitling one clerical employee only-the bookkeeper of the department-to the provisions of the fund, without exacting from him the 2% salary contribution required from all other prospective beneficiaries.

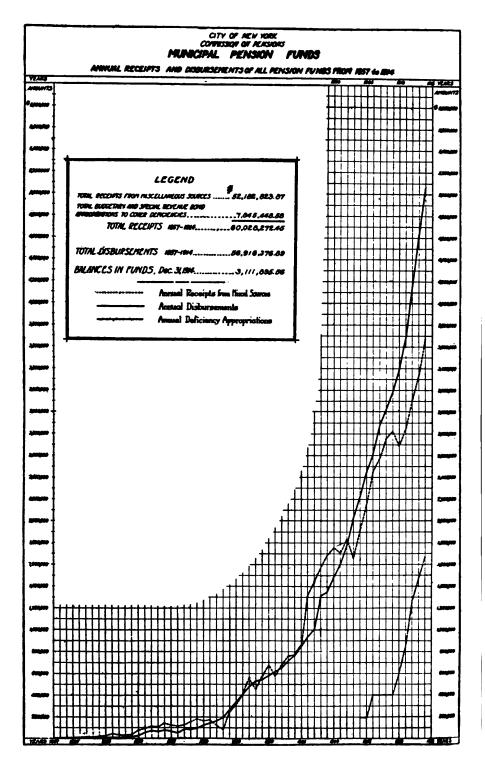
Practically Entire Pension Burden Borne by Taxpayers

In order to show the financial operations of the nine municipal pension funds, their receipts and disbursements have been summarized in a statement presented in Table 51 opposite page 156. The growth of the annual pension payments from the combined funds is indicated by the solid, or "pension," line on the chart on page 6. The growth of the regular annual revenues of the funds received from various sources, as provided by law, is illustrated by the dotted, or "revenue" line, while the "deficit" line, drawn by means of dashes and circles, shows the discrepancy between revenues and matured pension claims. Since 1904 this discrepancy has been covered by funds from the general tax levy.

Over 61% of total 57 years' pensions disbursed in last 10 years

The rapid increase in annual payments from all funds, as shown in the chart, is due to a number of causes, of which the most important are the numerical growth and increases in rates of compensation of the active force, the gradual inclusion of all branches of the service in the city's pension system, and the continuing liberalization of the original pension provisions. The following summarized statement of pension expenditures in five-year

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periods shows that over 61% of the disbursements of all city pension funds were made during the last 10 years of operation:

Period of Pension Disbursements	Amount of Disbursements	Per Cent. of Total Dis- bursements
1858 and 1859. 1860 to and including 1864. 1865 to and including 1869. 1870 to and including 1874. 1875 to and including 1879. 1880 to and including 1884. 1885 to and including 1889. 1890 to and including 1899. 1900 to and including 1899. 1900 to and including 1904. 1905 to and including 1904. 1910 to and including 1914. Total Disbursements.	10,722.83 55,063.03 291,288.98 380,823.49 895,206.01 2,301,271.34 3,344,111.79 5,461,392.95 9,124,048.07 14,129,609.26 20,922,569.14	

In considering the above statement, it must be remembered that the police pension fund was established in 1857, and the fire department relief fund in 1871. The pension funds for teachers and the employees of the department of health began to operate in 1894, and the recently established pension funds were created in the following years:

- 1902-College of the City of New York Retirement Fund
- 1906—Finance Department Retirement Fund (Extended in 1911, as shown below)
- 1911—City of New York Employees' Retirement Fund ("Grady Law")
- 1911—Department of Street Cleaning Relief and Pension Fund
- 1911—Supreme Court, First Department, Retirement Fund
- 1914-Supreme Court, Second Department, Retirement Fund

City paid more than 83% of total pensions

The total transactions of the nine pension funds during the past 58 years, as shown in detail in Table 51, opposite page 156, are summarized as follows:

	Amount	Per Cent. of Total
Receipts:		
Employees' Contributions	\$7,349,058.13	3 12.24
Employees' Contributions Indirect City Contributions	42,255,968.12	2 70.39
Direct City Contributions	7,845,448.59	3 13.07
Interest	2,271,951.2	
Donations, bequests, rewards, etc	305,846.40	.51
Total Receipts	\$60,028,272.4	100.00
Disbursements:		
Pension Payments	\$56,783,095.94	£
Administrative Expenses	133,280.9	5
Total Disbursements	\$ 56,916,376.89	-)
Balance in funds, Dec. 31, 1914	\$3,111,895.56	3

	Years Fund	Pensioners on Roll Dec. 31, 1914		Pensions paid in 1914	
Pension Fund	in Oper- ation	Number	Per Cent. of Total	Amount	Per Cent. o i Total
 Police Pension Fund Fire Department Relief Fund Teachers' Retirement Fund Health Dept. Pension Fund College of the City of N. Y. Retirement Fund City of New York Employees' 	58 44 21 21 21	4,234 1,686 1,549 97	51.4 20.5 18.8 1.2	\$2,456,805.13 1,058,424.21 1,183,397.08 78,776.65 4,325.00	48.6 21.0 23.4 1.6
("Grady") Retirement Fund 7. Dept. of Street Cleaning Relief	9	166	2.0	96,663.26	1.9
and Pension Fund	4	484 11	5.9	163,053.71 10,822.80	3.2
9. Supreme Court, Second Dept., Retirement Fund	1	1		900.00	
Total		8,232	100.0	\$5,053,167.84	100.00

Distribution of pensions among former employees and their dependents

The distribution of the 8,232 pensions among former employees and their dependents as of December 31, 1914, according to amounts paid, is shown in detail in Tables 22 to 24 opposite page 130. A summary of the data presented in these tables is given below:

EMPLOYEES' PENSIONS

Amount	Number	Per Cent. of Total
\$150 and less than \$600	983	17.0
\$600 and less than \$800	3,230	55.9
\$800 and less than \$3,500	1,560	27.1
\$3,500 to \$6,000	6	• • • •
Total	5,779	100.0
Average annual Pension		\$759.65
Total Annual Charge		\$4 ,390,018,49

DEPENDENTS' PENSIONS

Amount	Number	Per Cent. of Total
\$50 and less than \$300	216	8.8
\$300 and less than \$350	2,129	86.9
4000 and 1000 than 42,000 this trick the	107	4.3
\$1,500	1	• • • •
Total	2,453	100.0
Average Annual Pension Total Annual Charge		\$305.40 \$749,148.00

CHAPTER II

THE BENEFITS

Scope of benefit provisions

As previously stated, the existing pension schemes have been established largely on the initiative of employees who were desirous of securing the most advantageous provisions for themselves and their dependents. The government neglected to harmonize the efforts of individual groups in the accomplishment of their aims, and to safeguard the service by seeing to it that only such measures were enacted as would accomplish beneficial results at a reasonable cost.

A review of the great variety of benefit provisions which have been placed on the statutes as a result of this one-sided development of retirement schemes, requires definition of the purposes which they should be expected to accomplish. This must be done from the viewpoint of benefiting the service, as it is difficult to justify a retirement system for public employees solely on the basis of personal advantage to the prospective beneficiaries. Following this method, the existing benefit provisions may be divided into the following three groups:

- 1. "Superannuation" pensions, by means of which employees who, being unable to earn their salaries, due to old age, are released from the service. These benefits are also known as "service" or "regular" pensions.
- 2. "Disability" pensions, applicable to employees who, because of ill-health due to disease or accident, have become incapacitated before complying with the requirements for "superannuation" or "regular" retirement. These benefits are also known as "invalidity" pensions.
- 3. "Dependents" pensions, granted to those dependent on the earnings of the employee, in case of his death while in active service or in retirement. These benefits are granted to the widow, minor children or dependent parents of the employee.

The details of the somewhat complicated provisions in the nine separately operating pension schemes have been compiled under the above indicated three groups, in the chart opposite page 12.

Superannuation Pensions

Provisions for the support of those who arrive at the unproductive period of life are considered first, because under a sound pension system producing a "stabilizing" influence on the service they should have a larger application than the "disability" and "dependents'" pensions, which deal with exceptional contingencies and are intended merely as collateral inducements for employees to enter and continue in service. The details of existing superannuation provisions are presented at the head of the statement and include the "service," "service and age" and "superannuation" pensions, according to the conditions regulating an employee's eligibility to these benefits.

All but two funds recognize superannuation principle

It will be noted that seven of the nine existing pension schemes have provisions of one kind or another applicable to employees who have supposedly passed the stage of efficiency and do not require medical certification of incapacity as a condition for retirement. The two funds which restrict eligibility to pension on the basis of certified proof of incapacity are the Supreme Court, Second Department, retirement fund and the City of New York employees' ("Grady") retirement fund. The benefits of these pension schemes are included, therefore, in the group of "disability" pensions.

The conditions determining an employee's eligibility to a "superannuation" or "regular" pension vary in the seven funds having superannuation provisions. In five of these funds the only requirement is a stated service period. This applies to retiring employees of the departments of fire, education and health, the College of the City of New York and the Supreme Court, First Department. The two other funds impose, in addition, a minimum age limitation,—55 years for policemen and 60 years for street cleaners.

Retirement under the above "service" and "service and age" provisions is optional on the part of the employee. In three funds only—the police pension fund, the teachers' retirement fund and the College of the City of New York retirement fund—the law gives the pensioning authority the right compulsorily to retire employees who have passed a stated age, under special "superannuation" provisions.

The number of employees retired under the provisions referred to and drawing pensions on June 30, 1914, and their average age at that date are presented in the statement on page 13, which also includes, for purposes of comparison, the total number of pensioned employees on that date.

¹Compiled from Tables 25 to 39, pages 133 to 146, presenting the distribution of pensioners in the several funds by cause of retirement and present average age.

				
:	City of New York Employees' ("Grady") Retirement Fund	Street Cleaning Department Relief and Pension Fund	Supreme Court, First Department, Retirement Fund	Supreme Court, Second Department, Retirement Fund
After 20 years (-		1/50 of last 2 yrs.' avge. for ea. yr. 1	
After 25 years		••••••	½ average of last 2 years.	
After 80 years				
After 25 years		••••••	½ average of last 2 years	•••••
After 80 years			1/2 average of last 2 years	
25 years' servi		Min. 1/4 final pay		
Age 65 and 34				
Age 65, 80 yes		•••••		
Age 60				
Less than 10 r After 10 years After 20 years	-	\$300 Min. ½ final pay	See below Max. 1/4 average of last 2 years	
After 20 years After 20 years	Max. 14 average of last 3 years 7,8	Min. ½ final pay	Max. 1/2 average of	
After 25 years	Max. ½ average of last 3 years 7,8 Max. ½ average of last 3 years 8	Min. ⅓ final pay Min. ⅓ final pay	Max. 1/4 average of last 2 years Max. 1/4 average of last 2 years Max. 1/4 average of last 2 years	Max. 1/4 average of last 2 years Max. 1/4 average of last 2 years
Less than 10 s After 10 years After 20 years		Min. ½ final pay	See below Max. ½ average of last 2 years	
After 20 years	Max. ½ average of last 3 years 7,8	Min. ½ final pay Min. ½ final pay	Max. ½ average of	May 14 avange of
After 25 years	Max. 1/4 average of last 3 years 7,8 Max. 1/4 average of last 3 years 8	Min. 1/2 final pay	Max. 1/4 average of last 2 years Max. 1/4 average of last 2 years	Max. 1/4 average of last 2 years Max. 1/4 average of last 2 years
1	-			
Of members d		Max. \$300 See below		
Of members d Of pensioners		Max. \$200 Max. \$200		
Of members d				
Of members k		Max. \$200		
Of members d Of members d Of pensioners		See below Max. \$200 Max. \$200		
Of members k		Max. \$200		
Of members d		•••••		
	<u></u>	<u> </u>	2011 437	

¹ In cas \$1,500 for teachers and \$2,000 for supervising officials. ⁴ Not more than \$600 to dependents of one members, ½ final pay; presidents and professors, at lowest even multiple of \$1,000, not less than one-half final pay. ⁴ for county offices considered. ⁹ To dependent widowed mothers only.

• 1

Pension Fund	Pensioned Employees on the Rolls on June 30, 1914	Employees Pensioned Under "Service," "Service and Age" and "Superannuation" Provisions		
		Number	Per Cent. of Total Pension Roll	Average Present Age
1. Police Pension Fund	1,521 81 4 106 321	851 582 1,232 73 4 21 ¹	31.3 64.7 81.0 90.1 100.0 6.5	67.0 58.6 64.9 57.9 74.8 67.9
Total	5,658	2,763	48.8	••••

The following is a comparison of the number of retirements under "superannuation" provisions with the total number of retirements, during the six-year period ending June 30, 1914:2

Pension Fund	Total Number of Retire- ments,	Employees Pensioned Under "Service," "Service and Age" and "Superannuation" Provisions		
	July 1, 1908, to June 30, 1914	Number	Per Cent. of Total Retirements	
 Police Pension Fund Fire Department Relief Fund. Teachers' Retirement Fund. Health Department Pension Fund. College of the City of N. Y. Retirement Fund N. Y. City Employees' ("Grady") Retirement Fund. Department of Street Cleaning Relief and Pension Fund. Supreme Court, First Department, Retirement Fund. Supreme Court, Second Department, Retirement Fund. 	549 805 61 3 116 398	373 354 586 56 3 26	22.36 64.48 72.80 91.80 100.00 6.53	
Total,	3,610	1,398	38.73	

¹ No pensions have been granted from this fund under its "service" provisions.

² Compiled from Table 19, page 124, showing the separations from the active service during the six-year period ending June 30, 1914.

Early retirements cause loss to city's service

Provisions giving employees the option to retire early in life without proof of incapacity, after having served a stated number of years, may be considered among the most objectionable features of the city's pension system. In foreign countries, civil service and industrial pension schemes set a minimum age limitation, generally 60, 65 or 70 years, for retirement on a regular, or superannuation, pension. When the requirement is a stated service period, its length, generally 35 years or over, is so calculated as to prevent "early" retirements. The same method is followed in the majority of industrial pension schemes in the United States. Only municipal pension funds in this country cling to the exploded theory that a given number of years in a department, rather than advanced age, determines the decline of usefulness of a public employee.

The "service" provisions in five of the city's pension funds permit the retirement, early in life, of employees who have entered the service at the minimum entrance ages, as may be seen from the following:

Pension Fund	Minimum Age of Entrance into Service	Years of Service Required for Op- tional Re- tirement	Age at Which Optional Retirement is Possible
Fire Department Relief Fund	18 14 21	20 30 20 20 20	41 48 34 41 43

The age limitation of 55 years after 25 years of service for retiring policemen is obviously low. The street cleaners must have passed the age of 60 years and have served 20 years before they may apply for pension.

Employees between the ages of 34 and 55 years are in the prime of life, and if they have had 20 or more years' experience they are in the majority of cases a distinct asset to the service. By permitting their retirement without proof of incapacity the city injures its own interests. Those who avail themselves of their pension rights at an early opportunity generally do so either to engage in business for themselves or to supplement their pension income through employment elsewhere. They represent the progressive and live element of the service, to whom the city should offer inducement to continue instead of encouragement to leave.

That the practice of early retirement is quite general is indicated by the following average ages at which employees who were on the pension roll on June 30, 1914¹, have retired under the "superannuation" provisions of the pension funds mentioned.

¹ Compiled from Tables 34 to 39, pages 143 to 146, showing the distribution of "service" or "superannuation" pensioners by years of service and age at appointment and retirement.

Number of "Super- annuation" Pensioners on the Rolls on June 30, 1914	Average Age at Entrance into Service	Average Service Prior to Retire- ment	Average Age at Retire- ment
	27.9	28.5	56.4
582	26.7	25.3	52.0
71	33.1	33.8	66.9
1,161	21.2	36.1	57.3
'			1
71	31.2	23.2	54.4
2	25.5	28.5	54.0
4	59.0	12.3	71.3
21	40.4	26.7	67.1
	of "Super- annuation" Pensioners on the Rolls on June 30, 1914 851 582 71 1,161 71 2 4	of "Superannuation" Pensioners on the Rolls on June 30, 1914 851 27.9 26.7 71 33.1 1,161 21.2 71 31.2 2 25.5 4 59.0	of "Superannuation" Pensioners on the Rolls on June 30, 1914 851 27.9 28.5 26.7 25.3 71 33.1 33.8 1,161 21.2 36.1 71 31.2 23.2 2 25.5 28.5 4 59.0 12.3

The data shown above is meager in the case of retirement of women employees of the health department and professors of the city college. The average service period does not include outside experience which is credited in retiring college professors and teachers of the general school system. In considering the retirement of policemen and street cleaners, the minimum age limitation of 55 and 60 years, respectively, must be kept in mind, and also the fact that up to a recent date the appointment of street cleaners was not regulated by maximum entrance age restrictions. Entering the department late in life, the minimum 20 year service restriction, rather than the age limitation of 60 years, controlled their optional retirement.

It will be noted that, with the exception of men teachers, college professors and street cleaners, those who retired under the supposed "superannuation" provisions of the six pension funds have done so at the average age of from 52 years in the fire department to 57.3 years in the case of women teachers in the department of education. It should be observed also that those who promptly availed themselves of the opportunity to retire, did so at ages well below those given above as averages.

The opportunity for optional early retirement in full health in departments covered by present "superannuation" provisions depends on the actual entrance age of employees and the service and age limitations imposed on applicants for voluntary retirement. The extent of this opportunity is illustrated by the number of employees of indicated age groups in active service on June 30, 1914, who, under existing provisions, are eligible to such retirement.¹

¹Compiled from Tables 10 to 18, pages 106 to 122, showing the distribution of the active service by present age and years of prior service.

	Employees in	Employees Eligible to Optional Retirement, Classified by Age Groups						
Pension Fund	Active Service on June 30, 1914	40 and Less Than 50	50 and Less Than 60	60 and Over	Total	Per Cent. of Active Force		
Police Pension Fund Fire Department Relief Fund. Teachers' Retirement Fund:		194	227 187	77 41	304 422	2.82 8.42		
Men	2,608 17,980	106	22 644	28 179	50 929	1.92 5.17		
Men	867 395	20¹ 3	13 1	13 	46 4	5.31 1.01		
Retirement Fund Department of Street Cleaning	218	11	8	14	33	15.14		
Relief and Pension Fund	5,426	••••		70	70	1.29		
Supreme Court, First Depart- ment, Retirement Fund	294	3	23	20	46	15.65		
Total	43,580	337	1,125	442	1,904	4.37		

¹ Includes 4 men below age 40.

The propriety of offering the opportunity of voluntary retirement to 1,904 employees, or 4.37% of the active force, without proof of incapacity, depends principally on the age at which the average employee may be considered as unable to withstand the strain of his particular duties. A large proportion of the 442 eligible employees who have passed the age of 60 years, including especially the 188 policemen, firemen and street cleaners, are probably superannuated. The desirability, however, of offering the 1,125 employees between the ages of 50 and 60 years the option of leaving the service on pensions is seriously questioned. No logical justification whatever, except disability, can support the claim for retirement allowances of the 337 employees who have not yet reached the age of 50. The fact that they may be pensioned on their own volition is a serious indictment of the present pension policy.

Delayed retirements cause loss to city's service

Retirement from service on a pension income well below an employee's active compensation is an inducement to retire only to those who expect to supplement pension payments by their own efforts after retirement. On the other hand, with advanced age and consequent reduced opportunities for outside means of support, the prospect of a half-pay pension, requiring considerable curtailing of an employee's budget, becomes less and less alluring. Those, therefore, who do not retire in the prime of life develop a strong reluctance to give up their employment as they grow older, especially if there is a family dependent on their support. The resulting super-

annuation problem and consequent serious loss to the city through the stagnation of its service can only be avoided when the retirement of emplovees of advanced age is made mandatory by law.

None of the city's pension funds include such mandatory provisions. In the police pension fund and in the pension funds applicable to teachers and college professors, the law provides for compulsory retirement at ages 60 and 65, respectively. It gives discretion, however, to the pensioning authorities to enforce or disregard these rules. In the police pension fund the provision has not been generally applied. In the teachers' retirement fund, pursuant to a by-law of the board of education, automatic retirement of the teaching staff does not take place until age 70 is reached.

The presence of employees of advanced age in the various branches of the service covered by voluntary "superannuation" provisions indicates the shortcomings of a system which does not include mandatory retirement. The following statement of employees in active service in the departments in question on June 30, 1914, who have passed the age of 60 years, illustrates this phase of the retirement problem:

	Employees in	Employees Over 60 Years of Age in Groups Indicated						
Pension Fund	Active Service on June 30, 1914	60 and Less Than 65	65 and Less Than 70	70 Years and Over	Total	Per Cent. of Active Force		
Police Pension Fund Fire Department Relief Fund. Teachers' Retirement Fund:	10,783 5,009	71 34	21 9	6 3	98 46	.91 .92		
Men	2,608 17,980	68 192	28 51	···· <u>·</u>	96 247	3.68 1.37		
Men	867 395	26	15	13	54 4	6.23 1.01		
College of the City of N. Y. Retirement Fund	218	7	7	5	19	8.72		
Relief and Pension Fund	5,426	259	83	20	362	6.67		
Supreme Court, First Department, Retirement Fund	294	18	20	14	52	17.69		
Total	43,580	678	235	65	978	2.24		

The ineffectiveness of the present system as a superannuation measure, as well as its tendency to favor special groups of employees, is emphasized by the fact that 536 of the 978 employees of 60 years of age or over are not eligible to optional retirement, while 1,462 employees below that age may avail themselves of that privilege upon application. This condition in the various branches of the service is illustrated by the following statement:

¹ Compiled from Tables 10 to 18, pages 106 to 122, showing the distribution of the active force by present age and years of prior service.

Pension Fund	Em- ployees in Active	Employees 60 Years of Age or Over Who Are Not Eligible to Optional Retirement		Years of Over W Elig	ho Are nble tional	Employees Less Than 60 Years Old Who Are Eligible to Optional Retirement	
	Service on June 30, 1914	Num- ber	Per Cent. of Active Force	Num- ber	Per Cent. of Active Force	Num- ber	Per Cent. of Active Force
Police Pension Fund Fire Department Relief Fund Teachers' Retirement Fund:	10,783 5,009	21 5	.19	77 41	.71 .82	227 381	2.11 7.61
Men	2,608 17,980	68 68	2.61 .38	28 179	1.08 1.00	22 750	.84 4.17
Fund: Men Women	867 395	41 4	4.73 1.01	13	1.50	33 4	3.81 1.01
College of the City of N. Y. Retirement Fund Department of Street Clean-	218	5	2.29	14	6.42	19	8.72
ing Relief and Pension Fund Supreme Court, First Depart- ment, Retirement Fund		292 32	5.38 10.88	70 20	1.29 6.80	26	8.85
Total	43,580	536	1.23	442	1.01	1,462	3.36

Old age in departments not covered by superannuation provisions

In branches of the service where superannuation provisions are lacking and the retirement of superannuated employees may be effected only on the ground of disability, after a stated number of years, old age exists in a high degree, as shown in the following statement ¹:

	Employ- ees in Active							
Pension Fund	Service on June 30, 1914	60 and Less Than 65	65 and Less Than 70	70 Years and Over	Total	Per Cent. of Active Force		
New York City Employees' ("Grady") Retirement Fund Laborers, Men Laborers, Women Clerks, Men Clerks, Women Mechanics. Exempt employees Supreme Court, Second Department, Retirement Fund	32,856 10,841 1,174 9,745 2,532 6,064 2,500	1,506 772 51 329 12 272 70	1,095 577 22 237 10 193 56	1,016 547 11 267 6 151 34	3,617 1,896 84 833 28 616 160	11.01 17.49 7.16 8.55 1.11 10.16 6.40		
Total	32,994	1,514	1,106	1,030	3,650	11.06		

¹Compiled from Tables 15 and 18, pages 113 to 122, showing the distribution of the active force by present age and years of prior service.

The above figures show that 3,650 employees, or 11.06% of the active force, are 60 years of age or over, 2,136 employees, or 6.47%, are past 65 years of age, and 1,030 employees, or 3.12%, are past 70.

The New York City employees' retirement fund and the Supreme Court. Second Department, retirement fund require a service period of 303 and 25 years, respectively, for retirement on the basis of certified proof of incapacity. The highly unstable character of the service covered by the general provisions of the New York City employees' retirement fund is indicated by the large number of resignations and dismissals as shown in Table 19, The younger employees have been affected mostly. Those employed late in life have shown a tendency to remain in service, owing, presumably, to their larger family responsibilities and to the reduced opportunity for outside employment. Only a small proportion of the aged employees, therefore, have served the required number of years to come under the retirement provisions. This shortcoming of the law as a superannuation measure is fully illustrated by the statement below, and is accentuated by a comparison with similar data showing the condition existing in branches of the service covered by the superannuation provisions discussed in the preceding pages.

	Employ- ees in Active Service	60 Yes Who A Eligi	ees Over ars Old are Not ble to ement	60 Yes	rs Old Are ble to	Old W Eligi	0 Years
Pension Funds	on June 30, 1914	Number	Per Cent. of Active Force	Number	Per Cent. of Active Force	Number	Per Cent. of Active Force
Seven Pension Funds Carrying Special Optional "Service" and "Superannuation" Provisions. Two Pension Funds Restricting Retirement to Employees Disabled After 30° and 25 Years of Service.	43,580	536 3,323	1.23	442 267	1.01	1,462	3.35
All Pension Funds	76,574	3,859	5.04	709	.93	1,522	1.99

It must be noted that the 536 employees over 60 years of age in departments covered by superannuation provisions are shown as not eligible to

¹Compiled from Tables 10 to 18, pages 106 to 122, showing the distribution of the active force by present age and years of service.

²Under the provisions of the "Grady Law" Civil War veterans may be retired after 20 years of service if found disabled. There were 657 veterans in the service on June 30, 1914. Of this number 87 had a service of more than 20 and less than 30 years, as shown in Table 15f, page 119.

retirement on their own volition. The majority of them may be retired on the initiative of the pensioning authorities under compulsory "superannuation" and "disability" features of the corresponding seven pension schemes. On the other hand, none of the 3,323 employees who have passed the age of 60 years and served in branches of the service covered by the restricted pension provisions of the two funds in question may be placed on the retirement roll even if found disabled. The majority of the 327 employees in the service covered by the restricted funds who were below and above age 60 on June 30, 1914, and were eligible to retirement, have since been The New York City employees' retirement fund has added, since that date and up to December 31, 1915, 277 pensioners to its roll, which includes several employees who have become eligible since June 30, 1914. Having almost exhausted its retirement possibilities, this, the largest of the nine existing pension funds, is powerless to cope with the superannuation problem, the seriousness of which is indicated by the fact that over 10% of the active force have passed the age of 60 years. In comparison with this condition, the right of 1,462 employees below age 60 in the seven favored departments to voluntary retirement, regardless of incapacity, is significant. It is a privilege not warranted by the interests of the service, and was conferred by provisions of law designed primarily for the personal advantage of groups of employees who stood behind their enactment.

Flat one-half salary pensions favor those least deserving

The pensions granted to employees who retire under the "service," "service and age" or "superannuation" provisions of existing pension funds are set forth in the statement of benefit provisions page 12. The law specifies the amount of these "regular" pensions of policemen, firemen, the teaching staff of the College of the City of New York and street cleaners at not less than 1/2 of salary received at the date of retirement. The pensions of employees of the health department. on the other hand, are limited to not exceeding 1/2 of final pay. The pension scale of employees of the Supreme Court, First Department, provides for ½ of the average salary of the two years preceding retirement. The pensions of teachers are fixed at 1/2 of final salary. The teachers' retirement fund, however, contains an exceptional provision for the benefit of the president and professors of Hunter College, whose half salary pensions are raised to the next even multiple of \$1,000. Similarly, the College of the City of New York retirement fund increases the 1/2 of salary benefits of the president by \$1,000 and the vice-president by \$500. The pensions of professors may be increased to \$3,000 if ½ of final pay is less than this amount.

The only fund imposing an additional minimum limitation is that of the teachers. Pensions granted after a minimum service of 30 years may not be less than \$600 per annum. This provision became inoperative long ago, as under existing salary schedules no teacher with over 15 years of service receives less than \$1,500 and the pension of ½ of final salary automatically fixes the minimum amount receivable at \$750 per annum.

This fund also restricts the amount of pension under the $\frac{1}{2}$ of final salary provision to \$1,500 per annum for teachers and principals and to \$2,000 per annum for supervising officials. This latter restriction affects at the maximum only about 2% of the entire force, as may be seen from Table 3 on p. 90, showing the composition of the teaching force by grades and average rates of compensation.

Viewing the existing pension rates as a whole, one-half of final salary is the pension generally granted. Where the legal definition of the pension is "not exceeding" one-half of salary, it invariably has been interpreted to mean ½ of salary. The provisions stipulating a pension of "not less" than ½ of salary received, as a general rule receive the same interpretation, with few exceptions which are separately discussed on pages 32 to 34.

The unfairness of this pension scale is obvious from the fact that a pension of ½ of salary is granted to firemen, employees of the health department, college professors and street cleaners after a minimum service of 20 years, to policemen and employees of the Supreme Court, First Department, after 25 years, and to teachers after 30 years. Ill-considered and expensive legislative favoritism, instead of a measurement of the comparative physical and mental strain on employees engaged in the various occupations, seems to be the basis of the differences in the length of the service period required for retirement on maximum pension. What may be a reasonable period of service for firemen, for example, may be an absurdly inadequate period for college professors and health department employees.

Another serious defect lies in the fact that additional service does not result in additional pension. Those who take advantage of service provisions to retire at the earliest opportunity, and therefore deserve the least recognition on the part of the city, have the benefit of more pension payments. Those who devote to the city's service their life-long efforts receive the same half-salary pension which, on account of their advanced age at retirement, they are able to enjoy only for a few years.

The persistent adherence by the majority of United States municipal pension funds to this antiquated practice is the more surprising in view of the almost universal recognition elsewhere of the advantages of logically relating the amount of pension to the value of services rendered. This is accomplished by grading an employee's pension in accordance with the number of years he has served. Abroad, 1/80 to 1/60 of salary for each year of service is the commonly accepted basis of grading the pension. Industrial pension schemes in this country generally grant benefits of 1% of salary for each year of service.

Salary at retirement objectionable basis for pensions

With the exception of the pensions granted from the Supreme Court, First Department, retirement fund at ½ of the average salary of the last two years, schemes providing superannuation benefits use as a basis for fixing the amount of pension the salary received by a prospective beneficiary at the date of retirement. This arrangement results in unduly increased pensions to those

whose retirement follows soon after a change in salary schedules and gives the beneficiaries an unwarranted advantage over those whose pensions were based on the lower salary rates. On the other hand, in the event of salary reductions, the consequently reduced pension is unfair to the employee. Finally, there is always the possibility of unwarranted promotion of an employee to a higher paying position shortly before retirement for the purpose of granting a larger pension.

Credit for "outside" experience a costly practice

In three of the city's pension schemes service rendered outside of the City of New York is credited to the employee in determining his eligibility to retirement. The provisions of the Supreme Court, First Department, require from the prospective beneficiary a total service of 25 years of which only the last 12½ years must have been rendered in the department, the other 12½ years being credited if the service was for the State of New York. In the event of loss of position through no fault of an employee the service requirement is reduced to 20 years and only the last 10 years must have been in the department. Outside professional experience of as much as 20 years anywhere in this country or abroad, in addition to a minimum of 10 years in the College of the City of New York entitles teachers in that institution to a full pension. A similar minimum requirement of 15 years in city schools and 15 years' experience elsewhere is included in the provisions of the teachers' retirement fund. Finally, the staff of Hunter College may be retired after 30 years of professional experience without the requirement of a minimum service in the city.

The practice of crediting outside experience has no doubt a practical value, at least when it is applied to the teaching profession, by offering experienced teachers an inducement to enter the city's service and at the same time enabling their retirement on an adequate pension after their period of usefulness expires. In accomplishing this, however, the city pays sometimes the larger part of the pension for services from which it has benefited only indirectly.

It would put the practice on a sounder basis and restrict it to appointments of unquestionable advantage to the service, if at the time of employment of applicants a settlement of the accrued pension claim on account of credited outside experience were made by the payment of the required amount of a reserve into the pension fund.

Disability Pensions

Provision for disability incurred in performance of duty has limited application

Of primary importance in pension schemes which apply to hazardous occupations are the benefits provided for disabilities incurred in the performance of duty. It is to the best interest of the community that a policeman, fireman or health officer should not be handicapped by the thought of consequences to himself or those dependent upon his support when his duties require deliberate exposure to the risk of life and limb. Similarly, the street cleaner who in the regular performance of duty is injured through no fault of his own is unquestionably entitled to the city's support.

The city's responsibility for such accidents is recognized in the pension funds of the police, fire, health and street cleaning departments by the omission of length of service requirements for eligibility to benefits when disability occurs. The benefits range from a minimum pension of ½ of final salary to those injured immediately after entering the service to a maximum pension of ½ of final salary after 20 years' service granted to policemen and the employees of the health department. Street cleaners receive a flat \$300 pension if disabled before having served 10 years, and not less than ½ of final salary after a longer service. Firemen receive one-half of final salary without limitation of the number of years served. If they are partially disabled they are kept on the payroll on full pay performing whatever light duties are assigned to them. Their retirement on half-pay in the absence of special details can only be effected on their own consent.

The difference in the amount of pension accruing as a result of the same kind of risk indicates at a glance the lack of fair and impartial treatment. It is difficult to find justification for the grant to a disabled policeman of a one-quarter pay pension when a fireman under identical conditions may receive a benefit of one-half of his salary. Neither is it logical to restrict the pension of a disabled employee of the health department after 10 years and less than 20 years of service to an amount below one-half of his salary when a street cleaner disabled after the same number of years is entitled to a benefit of half-pay or more.

Length of service does not seem applicable as a basis for grading the amount of the benefit granted for disability incurred in the performance of duty. A liberal pension is as justifiable immediately after the employee has entered the department as it is after he has served a number of years. The one-half salary pension without regard to length of service appears to have more justification under these circumstances than under any other.

The main difficulty in the practical operation of provisions for disability in performance of duty is in preventing the application of the comparatively liberal benefits to disablements not incurred in the performance of duty. The present provisions do not define adequately the conditions under which these special benefits may be granted. Each of the frequently changing administrations of the departments concerned adopts its own method of interpretation, producing differences in results. An employee may be regarded as constructively on duty at all times, except when on leave of absence, and any health impairment or accident would entitle him to retire under the special benefit provisions. On the other hand, the benefits may be made available only to those who become disabled as a result of some specific act of duty.

The comparative importance of the provisions for disability incurred in

performance of duty, as separate features in the four pension schemes in which they are included is indicated to a certain degree by the following comparative statement¹ of pensioned employees on the rolls on June 30, 1914, and the number of those who retired under the special provisions discussed:

	Pensioned Employees	Employees Pensioned Under Provisions for Disability Incurred in Performance of Duty				
	on the Roll on June 30, 1914		Per Cent. of Total Pension Roll	Average Service (Years)		
Police Pension Fund	81	113 88 8	4.16 9.79 9.89 1.87	7.58 13.98 7.13 10.33		
Total	4,017	215	5.35	•••••		

The above figures probably understate the extent of disability incurred in the performance of duty. Employees disabled after having complied with the requirements for full pension on application retire as a rule on regular pensions and their pension records do not contain reference to disability. The comparatively short periods of average service shown in the statement indicate that in the majority of retirements disability and its cause was specified only when required to secure special benefits.

"Ordinary" disability provisions a separate feature of pension funds

"Ordinary" disability provisions, for the retirement of employees whose disability is not caused or induced by the performance of duty, cannot be based on a responsibility of the government for their support. Their justification is the necessity of preventing the continuation at full pay of employees who, though not superannuated, are, nevertheless, due to health impairment or accident, incapable of giving full return for compensation received.

The appeal against summary dismissal is powerful. Invalidity is a contingency of infrequent occurrence. It is generally not guarded against by the individual who, if he is prudent, has difficulty enough in taking care of the hazards of premature death and reduced earning power in old age.

¹Compiled from Tables 40 to 43, pages 148 and 149, showing the distribution of pensioners retired for disability in performance of duty by years of service and age at appointment and retirement.

The consequences are distressing and the disaster especially pathetic when there is a family dependent on the employee's support.

In a service without a retirement system, those in authority, humanely enough, show a disposition to sacrifice the interests of the service for the sake of the individual. Where a retirement system is in operation but fails to cover cases of "ordinary" disability, the employee's theoretical right to a proportionate part of the "regular" pension lends the claim of justice to human sympathy.

A satisfactory solution of this phase of the problem demands consideration from a broad viewpoint. Preventive measures, such as adequate medical entrance examinations and an effective system of supervision of the health of employees while in active service, are of primary importance. But even an ideal preventive system does not eliminate the need for support in cases of unpreventable disabilities. Whether or not such support should take the form of a pension or be restricted to lump sum benefits, whether it should be graded according to length of service and extent of disability, are a few of the many questions which require a logical solution, to be followed up by effective legal and administrative safeguards against the unwarranted use of whatever benefit provisions are adopted.

Neither the introduction nor the subsequent development of the existing provisions for "ordinary" disability in the city's pension schemes have been preceded by an adequate consideration of principles of equity and good management. The predominant feature of the provisions is the privileged treatment accorded to groups of employees which is not justified by the requirements of their various service branches, and is explained by the readiness of past legislatures to enact any kind of a retirement bill desired by public employees and not actively opposed by the general public. Thus, as may be seen from the details of the "ordinary" disability provisions presented opposite page 12, the fireman may be pensioned the day after his entrance into the service, though disabled through accident or health impairment in no way contingent upon his official duties. The policeman and street cleaner must serve a minimum of 10 years before they are entitled to the same privilege. Twenty years is the minimum service requirement for disabled teachers, and employees of the health department and the Supreme Court, First Department; 25 years is the minimum for employees of the Supreme Court, Second Department. Finally, 30 years of service must stand to the credit of the employees covered by the provisions of the "Grady Law" before disability entitles them to a pension. These minimum requirements are further reduced by the practice of allowing credit for "outside" experience, as explained in the statement referred to.

The following statement 2 contains a comparison of the number of employees pensioned on the ground of disability with the total number of pensioned employees who were on the rolls on June 30, 1914.

¹ Excepting Civil War veterans, who may be retired after 20 years of service.

² Compiled from Tables 44 to 50, pages 151 to 154, showing the distribution of "ordinary" disability pensioners by years of service and age at appointment and retirement.

•	Pensioned Employees	Employees Pensioned Under "Ordinary" Disability Provisions				
Pension Fund	on the Rolls on June 30, 1914	Number	Per Cent. of Total Pension Roll	Average Service		
1. Police Pension Fund	899 1,521 81	1,752 229 289	64.51 25.47 19.00	21.23 15.71 23.79		
ment Fund	4 106	106	100.00	34.02		
 Department of Street Cleaning Relief Pension Fund	321	294	91.59	16.59		
tirement Fund	9	9	100.00	27.25		
tirement Fund	1	1	100.00	26.58		
Total	5,658	2,680	47.37			

To illustrate further the extent to which retirements have been permitted under the main groups of existing benefit provisions, the following figures show the distribution of pensioned employees on the rolls on June 30, 1914, on the basis of reasons stated in retirement papers:

Provisions Under Which Employees Were Placed on Pension Roll	Number on Rolls June 30, 1914	Per Cent. of Total Roll
"Superannuation" (including "service," "service and age" and "superannuation" provisions). "Ordinary disability". "Disability in performance of duty"		48.83 47.37 3.80

The important point in the above data is the fact that 2,763 employees, or 48.83% of the total pension roll, were pensioned under optional retirement provisions, without proof of incapacity, while 2,895 employees, or 51.17%, were placed on the rolls on the basis of medical certificates of inability to perform their duties. It should be remembered that the actual cause of retirement does not always coincide with the reasons given in pension records. Until these are changed to show correct facts in each case, no distinct line of demarcation can be drawn between retirements for superannuation and the two forms of disability.

Preventive measures interlocked with disability problem

The presence of the large number of disability pensioners on the city's pension roll makes the problem of disability of great importance. Of the total annual pension charge of \$4,390,018.49 for former employees, on December 31, 1914, as shown on page 10, approximately \$2,000,000 is a charge for disability pensions. No doubt a large part of this sum is a legitimate charge as the retirement laws stand today. On the other hand, there is no question but that a proportion of this vast expenditure could be saved not only by a systematic revision of provisions for disability after it has occurred, but also by the institution of effective measures for its prevention. The importance of such preventive measures is by no means limited to considerations of a possible saving of dollars and cents. The conservation of the health of its employees is an obviously legitimate function of the city as a model employer.

The initial feature of a satisfactory preventive system is the requirement of an adequate medical examination of entrants into the service. In the police, fire and street cleaning departments, applicants for appointment are subject to thoroughgoing tests which safeguard these branches of the service from men unable to withstand the strain of their duties. The medical examination of applicants for teachers' licenses, on the other hand, is performed in a more or less perfunctory manner, regardless of the fact that teachers, mostly women, are subject to great nervous strain in their profession, a complaint repeatedly voiced by them and included among the major causes for retirement under the disability clause of their retirement fund. The medical tests for appointments to other occupations are varied, according to the rules established by the civil service commission. This phase of the problem is an especially difficult one. It requires continuous development on the part of the city's medical staff, and should be correlated with the medical studies on the basis of statistics which form an important part of the management of a sound pension system.

Supervision of the physical well-being of those admitted to the service is the next important function of the city government in this regard. The condition of employees receives a good deal of attention in the police and fire departments, where medical staffs of 24¹ and 10 surgeons, respectively, are charged with the medical supervision of the uniformed forces. In the street cleaning department, where the nature of the work subjects the rank and file to considerable physical strain and exposure to inclement weather, the importance of health supervision in the interest of both the city and the man is obvious. Its necessity is further emphasized by the limited income of the employee and his lack of knowledge of sanitation and precautions for his physical well-being. Notwithstanding these special conditions, the city has taken no remedial steps. The duties of the four² medical examiners of the street cleaning department are restricted to physical examinations of applicants for appointment and retirement and to purely disciplinary func-

¹ Reduced in 1916 budget to 20 surgeons, provision being made for full instead of part time service.

² Increased in 1916 to 8 medical examiners.

tions of verifying the correctness of reported sickness of employees. In other branches of the service, with the single exception of the health department, no measures whatever are taken to help the employee in properly safeguarding and conserving his health. The fact that good physical condition is an important requisite for the efficient performance of duty, and that money spent in its conservation is a good investment for the city, is entirely overlooked.

That a comprehensive and purposeful system of health supervision of the city's employees is desirable does not require much argument. The practical difficulties and limitations which must be met should not prevent the introduction of initial measures which should be developed in the light of future experience and study. As in the matter of medical entrance examinations of applicants, the city's functions with regard to the supervision of the health of its employees should be correlated with the medical work required in the operation of the disability features of its pension system.

Disability provisions inadequately safeguarded

Under the existing system, the problem of disability in active service is dealt with only after the employee has become incapacitated for the performance of his duty, and the remedy is retirement on pension provided he has been in service the required number of years.

The successful application of these remedial retirement provisions depends on adequate safeguards, legal and administrative, against their unwarranted use. These safeguards must be established in the law as well as in the administrative machinery provided for its interpretation.

The law as it stands today gives a vague definition of what constitutes disability. "Permanent physical and mental disablement for the performance of duties" is, with slight variations in each of the city's pension schemes, the uncertain description of the condition of an employee which entitles him to retirement on his own initiative or at the instance of his superiors. This condition is supplemented in the police department by the restriction that the disability must not be the result of an employee's misconduct. In the police, fire, health and street cleaning departments the law requires, as a basis for the grant of pensions, the filing of a disability certificate made by a member of their respective medical staffs. In other funds such a stipulation is lacking. The law does not attempt to go any further into this complicated question. It leaves to the retiring authorities of each fund wide discretionary powers and the right and duty to establish such rules and regulations as are necessary for the correct interpretation of its provisions.

The retiring authorities are, therefore, handicapped at the very start by the difficult task of finding in the vague legal language a proper basis for adequate and practical regulations. This situation is aggravated by the wide latitude of administrative discretion. Frequent changes in departmental administrations make a continuous and purposeful development of

¹ In the fire, police and street cleaning departments measures have recently been inaugurated to encourage employees to maintain a sound physical condition.

an adequate system impossible. Such a system requires farsighted, patient study, in view of the fact that there are no satisfactory precedents either in this country or abroad. One of the first difficulties the retiring authorities have to deal with is the extent of an employee's disablement entitling him to a pension. This is a particularly troublesome problem in the police and fire departments, where strict physical standards regulate an employee's admission to the service. Shall the law be interpreted to mean that the policeman and the fireman must continue throughout his service in the same health and physical condition required at the time of his employment? Or, on the other hand, may be only be retired when his health has deteriorated to such a degree that he is unable to participate in an annual parade? An attempt to give the law the strictest interpretation would place the larger part of the two uniformed forces immediately on the pension roll. An overcautious construction of its meaning would substantially decrease the average of efficiency in the active service of the two departments. Another difficult question is the permanency of disability stipulated by the present law. In the majority of instances it is impossible to predict the duration of health impairment. Often the temporary character of a disease or injury is obvious, and all that is needed for the restoration of the employee's health is an opportunity for rest and proper medical care. Yet, within the meaning of the present law, such an opportunity by means of temporary retirement on a modest pension may not be given. And even if the disability be permanent, but partial, transfer to other kinds of work required by the city could be made, without recourse to pension and with but slight alteration of the employee's earnings.

The efficacy of the practice of retirement for disability, under the present vague law and indefinite responsibility of retiring authorities, depends on the validity of the certification of incapacity of an employee entitling him to retirement, and the subsequent steps taken to ascertain that the disability for which the employee was retired still exists and entitles him to continued support.

The certification of disability for the retirement of employees from departments covered by the "Grady Law" is made by a board of physicians not administratively responsible to the heads of these departments. The possibility of undue influence or a tendency on the part of physicians to approach their task of examination with a preconceived judgment is avoided. The value of disability certificates issued by physicians of the departments from which an employee is to be retired is somewhat reduced by the possibility of compulsion which may be exercised by department heads who have full appointive and dismissal rights over their medical staffs. This disqualifying consideration applies to the departments of police, fire, health and street cleaning. Of little or no value is the certification of disability by private physicians who are paid for their work by the applicant. Such certificates are admitted as a basis for retirement from the pension funds of the department of education and the Supreme Courts, First and Second Departments.

Administrative control of disabled employees after they have once been placed on the pension roll is not directly dealt with in existing retirement laws. The right of retiring authorities to subject disability pensioners to medical examinations may be found, at least by implication, in the legal provisions conferring discretionary powers for the granting and revocation of disability pensions. No measures have been taken to lend practical meaning and force to this logical, if only implied, right of restriction of disability benefits to those who are entitled to them on account of continued health impairment. The desirability of revising existing disability pension rolls by means of periodical medical examinations is obvious especially in the following pension funds, as indicated by the large number of disability pensioners and their comparatively low present average ages and the ages at which they retired:

	Number of "Ordinary	Average Age		
Pension Fund	Disability" Pensioners on June 30, 1914	At Retirement	On June 30, 1914	
Police Pension Fund		48.60 44.30	53.67 48.90	
Men	11 278	54.82 48.39	57.00 51.83	
Total	2,270			

Disability provisions illogical and inequitable

The discussion of legal and administrative handicaps to an effective enforcement of existing benefit provisions emphasizes the following criticism of the provisions themselves.

The difference in the minimum service period entitling an employee to retirement for ordinary disability from the various funds, as shown in the chart opposite page 12, is an obviously awkward arrangement. It not only subjects the present system to just criticism of unwarranted discrimination, but leaves branches of the service not covered by adequate disability provisions open to the undesirable effect of administrative makeshift arrangements for carrying a man on the payroll until he becomes eligible to retirement. It is hard to say what the proper minimum service requirement for disability benefits should be. In the large majority of foreign pension schemes, both for civil service and industrial employees, the service period for pension has been, so far, reduced to a minimum of 10 years. Return of contributions in contributory schemes and lump sum benefits in straight pension plans are not infrequent methods of dealing with the problem of disability when it occurs after a shorter service. Pension funds in this country treat the disability problem in an offhand manner and do not offer satisfactory precedents.

Since the risk of invalidity is present at any time and the consequences of its occurrence during the earlier years of service of an employee are most distressing, eligibility to benefits regardless of length of service would seem desirable. The infrequency of invalidity at earlier ages and the reduced longevity of pensioners whose health is impaired make bona fide retirements a comparatively inexpensive feature. The serious administrative difficulties in safeguarding such a measure, however, are probably the main reasons which have prevented its introduction.

The amounts of pension granted from various funds in cases of disability retirement are not controlled by the uniform application of a carefully determined principle. Though the need for invalidity provisions is present at any stage of employment, considerations of equity require the grading of the amount of pension in accordance with length of service. This principle is recognized in the teachers' retirement fund, which pays to teachers disabled after a service of from 20 to 30 years, a pension of 1/60 of the final salary for each year of service. In the police pension fund, the law allows the payment of 1/4 to 1/2 of final salary per annum for disability occurring after a service of from 10 to 20 years. It leaves, however, the determination of the exact amount to be granted within these limits to the discretion of the police commissioner. A disabled fireman with less than 10 years' service is entitled to 1/3 of final salary. After 10 years', and less than 20 years' service, a flat pension of not more than ½ of salary is granted. After the completion of the 20-year service period, the minimum pension granted is ½ of final salary and may exceed this amount if the fire commissioner so directs. The minimum pension granted to a disabled street cleaner is 1/2 of final salary after 10 years of service. In other pension funds the pension scale and service requirements for compulsory retirement for disability are identical with those applicable to voluntary retirement. One exception is the retirement fund of the College of the City of New York which has no provision for disability. Another is the New York City Employees' (Grady) Retirement Fund, the benefits of which are entirely restricted to cases of disability and are limited to not exceeding $\frac{1}{2}$ of the average salary of the three years preceding retirement.

Due to the far-reaching and costly consequences of its operation one feature of the present disability provisions requires special emphasis. In the pension funds of the police, fire and street cleaning departments, reduced service requirements without correspondingly reduced amounts of benefits granted for ordinary disability create a strong inducement for early retirement. A policeman must wait until he has completed 25 years of service and has reached the age of 55 before he is entitled to optional retirement at ½ final salary. A service of only 20 years without age limitation puts the same amount of pension within his reach if he is certified as disabled for the performance of duty. In the fire and street cleaning departments, the inducement for early retirement lies in the fact that the same pension of one-half final salary is granted after 10 years of service if disabled, as is available on application after 20 years of service.

These ill-considered disability provisions provide the main explanation of the high percentage of disability pensioners on the rolls of these three pension funds. As shown on page 26, disabled policemen formed 64.51% of the total pension roll of the police pension fund on June 30, 1914. In the fire department relief fund, the percentage was 25.47%, and in the fund of the street cleaning department it reached 91.59%. An additional contributing factor to the high percentage of disabled street cleaners is the fact that due to their entering the department late in life they are superannuated before having served 20 years and are retired in great numbers, voluntarily and compulsorily, under the 10-year disability provision.

Discretionary Excess Benefits and Re-employment of Pensioners by City

Discretionary excess pensions and the re-employment of pensioners in city departments are special features in the operation of present provisions which apply as well to the retirement of superannuated and disabled employees and require special mention as they illustrate most effectively the inconsistency and unfairness of the city's pension system.

Discretionary excess benefits invite favoritism

Members of the Hunter College staff and the president and professors of the College of the City of New York are given the privilege of retirement on pensions in excess of the ½ of final salary maximum granted to practically the entire remainder of the service. The fact that this privileged treatment of a small section of the service is regulated by definite provisions of law does not, of course, justify its existence, though it restricts the well-founded criticism of favoritism to the law itself, the administration having no choice in the matter.

Of much greater harm to the morale of the service is the extension of special favors to individual employees in the discretion of retiring authorities. This is made possible in the police, fire and street cleaning departments by the language of the law, requiring the pensions granted under certain provisions to be "not less than" one-half the employee's terminal salary. While in the police department no special meaning was given to this language, the commissioners of the fire and street cleaning departments interpreted it as a discretionary right to grant excess pensions. The details of the retirement on such excess pensions of 29 employees of the two departments are presented in the following tabulation:

EXCESS BENEFITS GRANTED TO EMPLOYEES IN THE DISCRETION OF HEADS OF DEPARTMENTS

No.	Rank	Date at Retirement	Commissioner Who Granted Pension	Reason Given for Excess Pension	Salary at Date of Retirement	Annual Pension	Excess Pension Over One-half Salary	Years of Service	Age at Retire- ment
		F	IRE DEP.	ARTMENT	RELIEF F	UND			
1 2 8 4 4 5 6 6 7 8 9 10 111 112 113 114 115 116 117 118 119 220 221 222 234 25 26	Deputy Chief Deputy Chief Deputy Chief Captain Captain Engineer Captain Fireman Captain Fireman Captain Fireman Captain Chief of Batal- lion Captain Chief of Batal- lion Captain Captain Chief of Batal- lion Captain Captain Captain Chief of Batal- lion Captain Chief of Battal- lion Captain Captain	12/ 1/1903 1/ 1/1910 3/ 1/1910 4/ 1/1910 5/ 1/1910 7/13/1910 7/14/1910 9/ 1/1911 1/ 1/1911 2/ 1/1911 3/ 1/1911 3/ 1/1911 4/ 7/1911 5/ 1/1911 5/ 1/1911 10/23/1913 12/24/1913 12/24/1913 12/24/1913 12/30/1913 12/30/1913 12/30/1913 12/30/1913 12/31/1913 3/18/1914 2/ 1/1915	Sturges Hayes Waldo Johnson	Not Given Not Given Not Given Disability Disability Disability Disability Disability Not Given Not Given Disability Not Given Disability Not Given Meritorious Service Not Given	4,200.00 2,500.00 3,300.00 2,500.00 1,600.00 4,200.00 4,200.00 4,200.00 3,300.00 2,500.00	\$3,000.00 2,500.00 1,666.06 1,066.66 1,066.66 1,666.66 933.33 2,500.00 1,666.66 933.33 1,050.00 1,666.66 1,666.66 1,666.66 1,666.66 1,666.66 1,066.66 1,066.66 1,066.66 1,066.66 1,066.66 1,066.66 1,066.66 1,066.66 1,066.66	586.66 586.66 266.66 416.66 233.33 1,250.00 416.66 233.33	42 38 28 20 20 20 27 40 38 29 21 30 20 27 38 21 30 21	49 70 60 50 49 47 54 61 63 49 57 48 61 45 67 66 45 50 57
				Total	\$78,220.00	\$56,499 .93	\$17,389 .93		

¹ Deceased pensioner.

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

1 2 3	Asst, Genl. Supt. ¹ Genl. Supt. Dist. Supt.	2/16/1913 2/16/1913	Edwards Edwards	Disability Not Given	\$2,500.00 3,000.00	\$1,500.00 ¹ 1,800.00	\$250.00 300.00	1934 32	62 67
	Acting Genl. Supt.	12/ 8/1913	Edwards	Disability	3,000.00	1,800.00	300.00	18	47
				Total	\$8,500.00	\$5,100.00	\$850.00		

¹ Deceased pensioner.

An inquiry into the records of the 26 employees retired from the fire department leads to the conclusion that with few exceptions official discretion was based on considerations other than those of extraordinary injury or merit. The statement referred to brings out the following significant features:

- 1 Out of 26 excess pensioners, only 4 are firemen. The remaining 22 are higher officers whose pensions at half-pay would have been ample to maintain them in comfortable circumstances.
- 2 No special justification for excess pensions to 11 pensioners, such as injury or special merit, was specified in the records, nor could any be discovered through investigation.

- 3 A chief of the department (case No. 15) was retired by Commissioner Waldo in good health at age 48 at a pension of \$6,000, the highest amount ever granted by the city—reason not given.
- 4 A pension of \$3,150, 75% of his salary of \$4,200, was granted by Commissioner Johnson to a deputy chief (case No. 21). He retired in the prime of life—at age 45—after a service of 24 years in the department and less than 20 years in the fire-fighting force.
- 5 The same commissioner, during the last week of his administration, retired 6 high officials of the department (cases 19 to 24) at more than half-pay, without any apparent reason for special consideration.

The circumstances surrounding the grant of excess pensions by Commissioner Edwards of the street cleaning department are equally significant. All three beneficiaries were the highest paid officers of the uniformed force. Two of them had a service of less than 20 years, and their retirement could be effected only on the ground of disability not caused in the performance of duty. The last-mentioned pensioner in the statement (case No. 3) was promoted, pending a promotion examination, from a salary of \$2,100 to \$3,000 during the same year in which he was retired. His pension of \$1,800 shows the costly results of the final salary basis, as well as of administrative discretion in fixing the amount of pension.

Simultaneous payment of pension and salary an unjustifiable practice

An expensive and demoralizing consequence of the separate, unrelated existence of the nine pension funds is the retirement of employees on pension from one department and their subsequent employment by another. Two phases of the retirement problem are involved in this practice. In the first place an employee who is superannuated or otherwise disabled for the work required in one department is not necessarily incapacitated for the efficient performance of duties in another branch of the government. The advisability of an effective system of transfers of employees between departments is obvious. It is properly a function of the civil service commission and the bureau of standards of the board of estimate.

The second phase of the problem is the propriety of paying a pension for previous work while the pensioner is on the active payroll. The prospective combined income from pension and salary which such a practice offers is a strong inducement for early retirement. And after a pensioner has been readmitted to the service, his final elimination when superannuated or disabled is complicated by his claim, however unjust, for another pension for additional service.

The natural remedy for the present illogical condition is the suspension of payment of pension while the pensioner is in active service. This is impracticable until new legislation is secured, as the present charter provision (Section 1560), which prohibits the employment of pensioners in city departments, has been held by the courts to be unconstitutional. Future constructive legislation should encourage transfers of employees to other branches

of the service, and permit the payment of pensions only upon final retirement but with credit for the entire service.

The details of the re-employment of pensioned policemen and firemen as brought out by the results of the census of municipal employees taken on June 30, 1914, are presented in the four statements on pages 36 to 43. On that date 29 pensioned policemen and 27 pensioned firemen were holding positions in other city departments. Their combined annual income in pension and salary was as follows:

	Annual	Annual	Combined Pension
	Pension	Salary	and Salary
29 Pensioned Policemen	\$22,004.00	\$34,425.00	\$56,429.00
	24,273.33	30,968.00	55,241.33
Total	\$46,277.33	\$65,393.00	\$111,670.33

In addition to pensioners who were in the city's service on June 30, 1914, the statements referred to show 18 pensioned policemen and 7 pensioned firemen who were employed in other departments and had withdrawn from the service prior to that date. Their combined annual income in pension and salary was as follows:

	Annual	Annual	Combined Pension
	Pension	Salary	and Salary
18 Pensioned Policemen	\$12,930.00	\$15,584.50	\$28,514.50
	6,680.00	6,026.50	12,706.50
Total	\$19,610.00	\$21,611.00	\$41,221.00

			Combine	d Income F	rom City
No.	Nature of Retirement	Rank	Annual Pension	Annual Salary	Total Income
				Pensioners	in the City's
1	Disability in performance of duty	Doorman	\$300.00	\$1,200.00	\$1,500.00
2 3	Disability Disability	Lieutenant Patrolman	1,125.00 700.00	1,500.00 757.50 ¹	2,625.00 1,457.50
4	Disability	Patrolman	358.00	600.00	958.00
5	Disability	Lieutenant	921.00	2,000.00	2,921 . 00
6 7	Disability Disability	Lieutenant Patrolman	1,125.00 700.00	1,500.00 1,500.00	2,625.00 2,200.00
8 9 10 11 12 13	Disability Disability Disability Disability Disability Disability Disability	Patrolman	700.00 700.00 875.00 700.00 700.00 700.00	1,500.00 1,400.00 1,200.00 750.00 1,460.00 1,500.00	2,200.00 2,100.00 2,075.00 1,450.00 2,160.00 2,200.00
14 15 16 17 18 19	Disability Disability Disability Disability Disability Disability Disability	Patrolman Patrolman Sergeant Patrolman Sergeant Patrolman	700.00 700.00 875.00 700.00 875.00 700.00	1,200.00 900.00 720.00 757.50 ¹ 1,200.00 900.00	1,900.00 1,600.00 1,595.00 1,457.50 2,075.00 1,600.00
20 21 22 23 24	Disability Disability Disability Service Service	DoormanLieutenantPatrolman	500.00 1,125.00 1,000.00 700.00 1,125.00	600.00³ 1,200.00 1,800.00 180.00 1,500.00	1,100.00 2,325.00 2,800.00 880.00 2,625.00
25 26 27 28	ServiceServiceServiceServiceService.	Sergeant Patrolman Patrolman Doorman	1,000.00 700.00 700.00 500.00	900.00 2,400.00 900.004 1,500.00	1,900.00 3,100.00 1,600.00 2,000.00
29	Service	Doorman	500.00	900.00	1,400.00
	Total		\$22,004.00	\$34,425.00	\$56,429.00

¹ Paid at a per diem rate; salary estimated on the basis of 303 working days. ² Paid diem rate; salary estimated on the basis of 240 working days. ⁴ Paid at a per diem rate;

Age at Date of Retire- ment	Service in Police Dept.		in Police		in Police		in Police		in Police		in Police		Pens i Ot	ice of nioner n her opt.	Department Employing Pensioner	In What Capacity
Service on .	Tune 30	0, 191.	4													
58 49	Yrs. 5	Mos. 8	Yrs. 20	Mos.	Pres. Boro. of Brooklyn Court, Municipal	Inspector of Sewer Connections Court Attendant										
52	22	5	$\left\{egin{array}{c} ar{2} \\ 2 \end{array}\right.$	3 10	Water Supply, Gas & Elec. Pres. Bor. of Bronx	Laborer										
35	10	3	{ ·	2 10	Water Supply, Gas & Elec. Tenement House	Clerk										
44	16	4	\{ \cdot \cd	6	District Attorney, Queens Court, County, Queens	County Detective										
42 49	20 26	1 10	₹ 3	5 7 4	Court, County, Bronx Court, Magistrates Court, Municipal	Court Attendant Court Attendant										
54 49 53 45 50	29 21 22 20 21	3 11 8 2	3 1 1 2 6	9 6 3 3	Court, Special Sessions Law, Brooklyn Law, Manhattan Finance, Bronx Parks, Brooklyn	Court Attendant Process Server Examiner Clerk Stable Foreman										
48	20	6	$\left\{ \begin{array}{c} 2\\1 \end{array} \right.$	5	Court, Magistrates Court, City	Court Attendant										
52 44 46 45 43	23 22 20 20 20 19	9 10 2	1 4 1	6 6 10 7	Law Education County Clerk, Queens Water Supply, Gas & Elec. Law	Examiner Attendance Officer Laborer Laborer Examiner										
48	24	8	{::	3 3 5	Public Service Commission Docks & Ferries Pres. Boro, of Manhattan	Attendant										
54 43 46 55	20 21 24 25	10 7 6 1	18	1 6 1 9	Parks, Bronx Court, Magistrates Court, Supreme Brooklyn Public Library	Laborer Court Attendant Court Attendant Caretaker										
59 57 4 9	38 30 20	3 9 	1 2 9 18	4 6 4	Court, Magistrates Court, Special Sessions Tenement House Law	Court Attendant Messenger Chief Examiner										
58 63	33	1 8	7 { 4 3	11 6 9	Pres. Boro. of Bronx Pres. Boro. of Brooklyn Court, Special Sessions	Foreman Court Attendant										
72	21	2	`	6	Education	Messenger										

at a per diem rate; salary estimated on the basis of 365 working days. ³ Paid at a per salary estimated on the basis of 225 working days.

POLICE PENSION FUND-

			Combined Income from City			
No.	Nature of Retirement	Rank	Annual Pension	Annual Salary	Total Income	
		Pensioners 1	pho were in	the City's Se	rvice During	
30 31	Disability	Patrolman Sergeant	\$614.00 750.00	\$757.50 ¹ 1,000.00	\$1,371.50 1,750.00	
32 33 34	Disability	Patrolman	660.00 700.00 1,000.00	757.50 ¹ 1,200.00 1,000.00	1,417.50 1,900.00 2,000.00	
35 36	Disability Disability Disability	Sergeant Patrolman Patrolman	631.00 700.00	1,200.00 900.00	1,831.00 1,600.00	
87	Disability	Patrolman	700.00	1,000.00	1,700.00	
38 39	Disability	Patrolman	600.00 700.00	900.00 360.00	1,500.00 1,060.00	
40 41	Disability	Patrolman Lieutenant	400.00 1,000.00	757.50 ¹ 626.00 ⁸	1,626.00	
42 43	Service	Patrolman	600.00 700.00	900.00	1,800.00 1,600.00	
44 45	Service	Captain Patrolman	1,375.00 600.00	900.00 626.00	2,275.00 1,226.00	
46 47	Service	Patrolman Doorman	700.00 500.00	600.00 900.00	1,300.00 1,400.00	
	Total		\$12,930.00	\$15,584.50	\$28,514.50	

¹ Paid at a per diem rate; salary estimated on the basis of 303 working days. ² Ap-Manhattan, at \$900 per annum. ² Paid at a per diem rate; salary estimated on the basis

PENSIONED POLICEMEN IN THE CITY'S SERVICE—Continued

Age at Date of Retire- ment	Po	ice in lice pt.	Service of Pensioner in Other Dept.		Department Employing Pensioner	In What Capacity	
Period Jan	uary 1						
44	Yrs. 17	Mos. 7	Yrs.	Mos.	Docks & Ferries	Attendant	
49	21	ż	I ::	ĭ	Fire	Lineman	
41	18	9	i	ī	Docks & Ferries	Laborer	
49	26	9 8	1	4	Court, Magistrates	Probation Officer	
45	20	1	1	9	District Attorney, Kings	Process Server	
46	18			3	Mayoralty	Inspector	
44	20	5	∫	4	Pres. Boro. of Man.	Attendant	
**	_~	•	 }	2	Pres. Boro. of Man.	Avocadano	
44	20	8	I{ · :	2	Pres. Boro. of Bronx		
F1			\ 4	10	Sheriff, New York County	Keeper Sheriff	
51 53	16 27	9	1 1	ii	Sheriff, Queens Correction	Assistant Deputy	
33 41	111	3	1 7	3	Pres. Boro. of Bronx	Hospital Helper Laborer	
47	20	9 3 2	7	3	Board of Water Supply	Laborer	
46	20	ĩ	ĝ	3	Pres. Boro. of Brooklyn	Inspector Sewer Con-	
20	~~	-			1165. Doro. or Droomyn	struction	
59	34	6	4	1	Education	Clerical Assistant	
62	23	3	l	4	Board of Water Supply	Patrolman	
56	27	6 2		6	Water Supply, Gas & Elec.	Laborer	
48	20	2	2	11	Education	Cleaner	
66	11		5	6	Bridges	Bridge Tender	
					-	-	

pointed (July 1, 1914) after the taking of census as attendant in office of Pres. Boro. of of 313 working days. ⁴Pension and salary terminated simultaneously by death.

			Combine	ed Income fr	om City
No.	Nature of Retirement	Rank	Annual Pension	Annual Salary	Total Income
				Pensioners is	the City's
1	Disability in performance of duty	Fireman	\$700.00	\$757.50 ¹	\$1,45 7.50
2	Disability in performance of duty	Fireman	700.00	1,800.00	2,500.00
8	Disability in performance of duty.	Fireman	700.00	1,125.00*	1.825.00
4 5 6	Disability Disability Disability	Foreman	1,250.00 900.00 1,080.00	1,800.00 1,200.00 1,200.00	3,050.00 2,100.00 2,280.00
7	Disability	Fireman	700.00 700.00	900.00 757.50 ¹	1,600.00 1,457.50
9 10	Disability Service	Fireman Captain	600.00 1,080.00	900.00 900.00	1,500.00 1,980.00
11 12 13	Service	FiremanChief of Battalion	700.00 1,650.00	757.50 ¹ 1,500.00	1,457.50 3,150.00
14 15	ServiceServiceService	Captain Foreman	1,250.00 1,250.00 1,250.00	1,500.00 1,500.00 1,200.00	2,750.00 2,750.00 2,450.00
16 17	Service	Engineer of Steamer	800.00 700.00	1,200.00 1,125.00 ²	2,000.00 1,825.00
18	Service	Foreman	1,080.00	1,500.00	2,58 0.00
19 20 21	ServiceServiceService	Fireman Fireman Engineer	700.00 700.00 800.00	1,460.00° 757.50¹ 1,500.00⁴	2,160.00 1,457.50 2,300.00
22	Service	Foreman	1,250.00	1,200.00	2,450 .00
23 24	Service	Fireman	600.00 700.00	757.50 ¹ 909.00 ¹	1,357.50 1,609.00
25 26 27	ServiceServiceService	Fireman Fireman Engineer of	700.00 933.33	1,095.00° 757.50°	1,795.00 1,690.83
2.	IOGL VAUG	Steamer	800.00	909.00 ¹	1,709.00
	Total		\$24,273 .33	\$3 0,968.00	\$ 55,241.33

¹ Paid at a per diem rate; salary estimated on the basis of 303 working days. ² Paid at rate; salary estimated on the basis of 365 working days. ⁴ Receives a salary of \$4,869, out

PENSIONED FIREMEN IN CITY'S EMPLOY

Age of Pensioner at Date of Retire- ment			Fire		Fire		Fire in		Department Employing Pensioner	In What Capacity
Service on June 30, 1914										
	Yrs.	Mos.	Yrs.	Mos.						
40	12	6	10	•:	Parks, Bronx	Laborer				
39	7	4	7	9	Water Supply, Gas & Elec- tricity, Brooklyn	Foreman				
46	17	5	10		President Borough of Bronx	Paver				
37	12	5	li	ż	Fire	Inspector				
34	10	3	ī	2	Fire	Inspector				
39	līĭ	ž	5	ī	Health	Inspector				
40	12	6		1	Sheriff, Queens	Deputy Sheriff				
67	39	·;	 2 9	3	Parks, Brooklyn	Laborer				
4 6	15	7	, 9	5	President Borough of Brooklyn					
54	25	5	$\left\{\begin{array}{c} 1\\3\end{array}\right.$		Bridges Street Cleaning	Bridge Tender Harness Maker				
66	34	2	3	7	President Borough of Bronx	Laborer				
48	20	4	ĭ	2	Fire	Inspector				
49	24	5	1	2	Fire	Inspector				
44	20	2	1	2 2	Fire	Inspector				
46 46	20 20	1	1	1	Fire Fire	Inspector Inspector				
30	20					тивреског				
43	20	1	$\begin{cases} 5 \\ 4 \end{cases}$	••	Parks, Bronx President Borough of Bronx	Paver				
45	20	1	\ i	2	Fire	Inspector				
43	21	6	7	1	Parks, Brooklyn	Foreman Painter				
50	20	5	.2	1	Parks, Bronx	Laborer				
49	24	1	,17	9	Education	Janitor				
47	24	11	$\left\{ egin{array}{c} \cdot oldsymbol{\dot{z}} \ \end{array} ight.$	3 1	Tenement House Health	Inspector				
54	25	9	16	- 1	Docks & Ferries	Laborer				
51	23	2	4	iö	Water Supply, Gas & Elec-	Mason's Helper				
50	20	4	3	4	tricity, Richmond National Guard	Mason's neiper Laborer				
54	26	8	2	6	President Borough of Bronx	Laborer				
54	30	9		6	President Borough of Bronx	Licensed Fireman				
			•							

a per diem rate; salary estimated on the basis of 225 working days. ^a Paid at a per diem of which assistants are paid. ^b Pension is excess of \$233.33 over one-half final salary.

FIRE DEPARTMENT RELIEF FUND-

			Combined Income from City			
No.	Nature of Retirement	Rank	Annual Pension	Annual Salary	Total Income	
		Pensi	oners Who V	Vere in the C	ity's Service	
28 29 30 31 32	Disability Disability Service Service Service Service	Asst. Foreman Foreman Fireman Fireman	\$1,250.00 1,250.00 900.00 1,080.00 700.00	\$1,200.00 720.00 1,060.50 ⁴ 900.00 782.50 ⁴ 757.50 ⁴	1,980.00 1,482.50	
34	Total	Engineer of Steamer	\$6,680.00	\$6,026.50	1,406.00 \$12,706.50	

¹ Paid at a per diem rate; salary estimated on the basis of 303 working days. ² Pension mated on the basis of 313 working days.

PENSIONED FIREMEN IN CITY'S EMPLOY—Continued

Age of Pensioner at Date of Retire- ment	Servin I	Fire	Pen	ice of sioner in her ept.	Department Employing Pensioner	In What Capacity		
During Per	During Period January 1, 1908 to June 30, 1914							
	Y78.	Mos.	Yrs.	Mos.				
44	18	10	1		Fire	Inspector		
41	l īĭ	2		4	President Borough of Man-			
		_	١	-	hattan	Typewriting Copyist		
51	22	11	3	4	Docks & Ferries	Dock Builder		
43	20	-8	4	î	Education	Janitor		
10	~~	0	T .	- · ·	Water Supply, Gas & Elec-			
			i	• 1	tricity			
47	20	4	4	41	President Borough of Man-			
	1		*	*	hattan	Foreman		
53	24	1	l	2				
99	24	1		2	Docks & Ferries	Laborer		
49	20	2	١	10	President Borough of Bronx	Laborer		

and salary terminated simultaneously by death. Paid at a per diem rate; salary esti-

A detailed study of the statements presented brings out a multitude of significant features among which are the following:

Statement of police pensioners in city's service:

- 1. Of the 47 pensioners, 28 retired before they were 50 years old.
- 2. The combined salary and pension of 37 pensioners exceeds substantially the pay they were receiving for active duty on the date of retirement, and brings up the question whether pensions are intended to assure a more comfortable existence after retirement than was possible by the pensioner's best efforts in his prime.
- 3. 34 pensioners were retired because of disability. 8 were subsequently employed as laborers and have held their positions for various periods up to 18 years. The correctness of their disability certificates or the propriety of their subsequent appointments should be questioned.
- 4. Pensioner No. 1 has been drawing a pension and a salary for 20 years. He served for the police department 5 years and 8 months. In 1914, he applied for another pension under the "Grady Law," which permits the retirement of Civil War Veterans after 20 years service. The Board of Estimate denied his application.
- 5. Pensioners Nos. 20 and 26 retired 19 and 18 years ago, respectively, after services of 20 years in the department. They have since been receiving a pension and a salary from the city. Pensioner No. 26, now an examiner in the law department, receives a pension of \$700 and a salary of \$2,400.

Statement of pensioned firemen in city's service:

- Of the 34 pensioners, 23 retired before they were 50 years old and 4 retired below age 40.
- 2. 26 pensioners substantially bettered themselves financially, the combined pension and salary exceeding their active pay at date of retirement.
- 3. 3 pensioners (cases Nos. 1, 2 and 3), who were retired for permanent disability incurred in the performance of duty, after a service of from 7 to 17 years, were subsequently employed as laborers and held their positions for 7 to 10 years.
- 9 pensioners were re-employed by the same department as inspectors of the fire prevention bureau.
- 5. A fireman (case No. 23), pensioned 16 years ago at age 54, after a service of 25 years and 9 months, has been employed continuously since retirement as a laborer in the department of docks and ferries, and is at present 70 years old.

Pensions to Dependents of Employees

Four of the nine pension schemes provide support to dependents

In four of the city's pension schemes provision is made for the support of dependents of deceased employees. The details are set forth in the chart opposite page 12.

The extent of the application of these provisions is indicated by the proportion of pensioned dependents on the rolls of the four pension funds on June 30, 1914. It must be kept in mind that the funds have been in existence for a varying number of years, those longest in operation having developed a more normal ratio of pensioned dependents than funds recently established.

¹Statement compiled from tables 25, 26, 28, 28a and 31, pages 133 to 140.

		Pen-	Pensioned Dependents of Employees on the Rolls on June 30, 1914					
Pension Fund	Year Fund Was Estab- lished	Em- ployees on the Rolls on June 30, 1914	Total	Per Cent. of Pen- sioned Em- ployees	Widows	Chil- dren ¹	De- pendent Parents	
Police Pension Fund	1857	2,716	1,566	57.7	1,441	124	1	
Fire Department Re- lief Fund	1871	899	787	87.5	669	70	48	
Health Department Pension Fund Department of Street Cleaning	1894	81	12	14.8	10	1	1	
Relief and Pension Fund	1911	321	116	36.1	106	7	3	
Total	••••	4,017	2,481	61.8	2,226	202	53	

The comparative annual financial burden imposed by the above indicated pensions to dependents of employees is shown in the following statement:²

	Total Annual Pension	Annual Charge	Annual Charge for Dependents' Pensions	
Pension Fund	Charge, December 31, 1914	for Employees' Pensions	Amount	Per Cent. of Employees' Pensions
Police Pension Fund	\$2,461,528.55	\$2,006,250.55	\$455,278.00	22.7
Fire Department Relief	1,065,939.73	804,469.73	261,470.00	32.5
Health Department Pension Fund Department of Street	80,307.50	76,707.50	3,600.00	4.7
Department of Street Cleaning Relief and Pension Fund	1	141,416.50	28,800.00	20.4
Total	\$3,777,992.28	\$3,028,844.28	\$749,148.00	24.7

Dependents of those killed or injured in performance of duty inadequately protected.

The principle of the city's responsibility for the support of the widows, children and dependent parents of employees killed or dying as a result of injuries received in the performance of duty is recognized in all four pension funds. The benefits granted vary, however, in amount and confer privileged treatment on groups of employees not enjoyed by others.

¹ One or more children of an employee considered as one unit.

² Compiled from tables 22, 23 and 24, opposite page 130.

The widow of a policeman is allowed a pension which must not exceed \$600 per annum. The fireman's widow under identical conditions receives one-half of her deceased husband's salary, the pension being limited, however, to not less than \$600 nor more than \$1,000 per annum. The pensions of widows of street cleaners and employees of the Health Department are limited to a flat amount of \$300 per annum. Similar discrimination in favor of firemen and policemen is shown in the higher benefits granted to their children or parents. One-half of the fireman's salary may be granted to his children or dependent parents not exceeding, however, \$500 per annum to each beneficiary. The benefits to a policeman's children or parents are restricted, in total, to \$600 per annum. The pensions available under the provisions of the Health and Street Cleaning funds are \$300 and \$200 per annum, respectively.

With the possible exception of the provisions of the Fire and Police department funds, the benefits are obviously inadequate and in most instances replace but a fraction of the financial loss to the dependents of an employee who lost his life in the city's service. Added to the inadequacy of the benefits is their uncertainty. Not only has the commissioner of the department the right to decide whether or not a pension shall be given, but each of his successors may disagree with his decision and revoke or amend the pension according to his interpretation of the law.

It is also important to correct the popular misconception that the majority of pensions are granted to the dependents of those killed or dying from injuries received in the performance of duty. As a matter of fact, these, though the most legitimate benefits, form a very small proportion of benefits to dependents. Only a fraction of the total number of dependents on the rolls on December 31, 1914, were in receipt of pensions granted on account of the death of employees due to the hazards of their occupation. This is shown in the following statement:

	Pensioned Dependents of Employees	Dependents of Employees Killed in the Performance of Duty		
. Pension Fund	on the Rolls on December 31, 1914	Range of Benefits, Per Annum	Num- ber	Per cent. of Total Roll
Police Pension Fund	7775 12	\$450 to \$600° \$350 to \$1,500 \$300	31 77 12	2.0 9.9 100.0 ³
Pension Fund	137	\$300	14	10.2
Total	2,453		134	5.5

¹ Compiled from table 24, opposite page 130.

One of the 31 pensioners is in receipt of a \$1,000 pension granted by special legislative act

³ The dependents' pensions in the health department are limited to cases of death in the performance of duty.

The proportion of deaths of employees due to the direct results of the performance of duty in the two most hazardous occupations of the city's service is brought out in tables 20-a and 21-a on pages 126 and 128. The totals for the 15-year period from 1900 to 1914 are summarized as follows:

	Total	Deaths Due to Performance of Duty	
Department	Number of Deaths 1900 to 1914	Number	Per Cent. of Total Deaths
PoliceFire	1,222 419	51 95	4.2 22.7
Total	1,641	146	8.9

Doubtful justification of pensions to dependents of those dying from ordinary causes

Under the present plan the bulk, or over 90% of all dependents' pensions, both as to number of beneficiaries and amounts annually paid, has been granted in cases of deaths of employees not caused by the performance of hazardous duty. The assumption by the city in three branches of the service, of a principle of support which has equal application to the city's entire personnel is a precedent which, no doubt, will be used by other groups of employees as an argument for the extension of similar benefits to their dependents.

Pensions to widows, orphans and other members of a deceased employee's family are an unavoidable and costly feature of pension plans where no return of an employee's theoretical equity in his prospective pension is made in case of his separation from service before becoming entitled to retirement. The arguments for the return of an equivalent are strong. Non-contributory plans either at their establishment or after a few years of operation are forced to include widows' pensions and lump sum gratuities as a costly alternative for returning to an employee leaving the service the contributions he has paid into the pension fund.

The propriety of supporting for life this class of dependents at the taxpayers' expense is not quite evident. The following questions are raised:

- 1. Should an employee be exempt from the plain duty of any citizen to guard his family against the ordinary risk of death not resulting as a direct consequence of his occupation?
- 2. Is the city justified in distributing money raised by general taxation for the support of dependents of civil employees who by reason of steady employment are in a better position to make provision for their families than the average citizen?

¹ The health department pension fund has as yet no provision for the support of families of employees who die from ordinary causes.

It is difficult to answer these questions in the affirmative and thereby establish a logical foundation for the payment of this class of benefits. It must be kept in mind that they are features of pension plans in operative city departments. The maintenance of a proper standard of efficiency in the public service is the main foundation of such plans,—an object accomplishing a public purpose and therefore justifying the expenditure of the taxpayer's money. The inclusion of benefit provisions for the dependents of those dying from ordinary causes transforms the pension plans into charitable schemes wholly out of place in their exclusive application to employees of city departments.

Inequitable distribution of benefits

The existing provisions, as indicated in the chart opposite page 12, are applicable to the widows and children of policemen and street cleaners who die from ordinary causes, not contingent upon the performance of their duties, after 10 years of active service or after retirement from the service on pension. The maximum amounts allowed under the law are generally granted,—\$300\cdot\text{1} in the police and \$200 in the street cleaning department. The provisions of the Fire department relief fund allow special privileges, by making the benefits which are limited to \$300 per annum available without any restriction regarding the deceased fireman's length of service, and by permitting dependent parents to become beneficiaries. No provision is made in the health department pension fund for the dependents of an employee whose death is not caused in the performance of duty.

The inequitable distribution of benefits is not limited to the privileged treatment in the various groups of employees. Within the same department, pensions of uniform amounts are granted regardless of the value of an employee's services as measured by his salary or length of employment. As a matter of fact, the shorter the period of service the greater the city's expense. The widow of a young employee will receive generally more pension payments than the widow of an older man who has rendered longer service.

Pensions insecure and based on principle of charity

The grant of pensions is discretionary with the heads of the departments, who have also full power of reduction, increase and revocation of the pensions already granted. The "need" of applicants and their moral conduct, which bear no logical relation to the deceased employee's equity in the fund, provide the basis for administrative action. These conditions may properly be used as a guide in the doling out of charity, but are entirely irrelevant in the application of provisions of a departmental pension fund. Even if the principle of charity were considered proper as a basis for the distribution of civil service pensions, the necessary machinery for the determination of facts is lacking.

¹The provisions of the police pension fund may be interpreted to allow the granting of pensions of \$600 per annum to orphaned children. Such interpretation, however, has not been adopted, and \$300 is the maximum pension granted.

Problem may be solved by separate fund for widows and orphans

Pensions to dependents of employees have been included in various civil service pension plans with praiseworthy benevolence but with complete lack of knowledge of their ultimate cost. If the city's pension system is to be placed on a sound basis, and adequate provision is to be made for meeting the immediate and ultimate obligations assumed, the benefits to employees themselves will probably require as much financial provision on the part of the city and employees as may reasonably be recommended. Additional benefits to dependents would make the cost prohibitive as a compulsory measure.

At the same time, due consideration must be given to the fact that the average employee is frequently debarred from making suitable provision for his family in case of his death, either through savings or adequate insurance. Such provision offered at cost would place within the employee's reach the means of carrying out at his own expense his principal family obligations. A separate fund for pensions to widows and orphans might be established, and the cost met by salary deductions either at the option of each individual employee or upon a majority vote of groups of employees. This suggestion is made very tentatively and merely to indicate an intention to give the important problem very careful consideration.

CHAPTER III

METHODS OF FINANCING AND SOURCES OF INCOME

Inevitable growth of future claims disregarded at establishment

Lack of knowledge of the extent of future obligations and oblique methods of financing fund requirements were the main characteristics in the establishment of the city's pension funds.

A rough guess was first made of the probable amounts required to meet currently maturing pension claims for a few years ahead. The next step was to assume that these demands would remain stationary forever thereafter or, at worse, increase in equal ratio with the annual payroli. The goal of the procedure was to secure an income preferably through the automatic diversion to the fund of more or less obscure miscellaneous city revenues. In the selection of such revenues care was generally taken that the proceeds would net some margin of safety over and above the guessed annual pension demands.

While the whole procedure deserves condemnation, its principal fallacy is the optimistic expectation of a stationary or only slightly increasing future pension charge. The persistence in this misconception, even to the present day, is unfortunate and surprising. It continues to lay the foundation for future disaster of newly established funds and greatly handicape the introduction of sane methods of financing pension systems. The great number of object lessons furnished by the experience of pension funds abroad, as well as in the United States, has been in the past and is at present ignored. Pension disbursements, according to length of operation and extent of benefits allowed by the various systems, have risen from a fractional part to 30 or more per cent. of the active payroll.\(^1\) The city's own experience gives a foretaste of the future unavoidable growth of pension demands if existing conditions are allowed to continue. The following statement\(^2\) shows the increasing annual pension demands of the nine pension funds since 1905, expressed as a percentage of the corresponding active payrolls:

¹ London police pensions amounted in 1914, after 70 years of operation, to 30% of the payroll. The present proportion of the active payroll paid in pensions is 17% in the French National Civil Service, 33% in the Austrian Civil Service, 37% in the Municipal Civil Service of Berlin.

² Compiled from Tables 63 to 71, pages 165 to 171.

Pension Fund	Year Fund Estab-	Fund Years Indicated						he			
	lished	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
 Police Pension Fund Fire Department Relief 		11.4	11.3	12.1	12.1	12.2	12.4	13.0	14.5	15.7	16.2
\mathbf{Fund}	1871	11.8	11.3	11.3	11.3	11.6	12.1	13.1	14.4	13.9	14.1
3. Teachers' Retirement Fund	1894	I	3.7	3.9	3.8	3.9	4.0	4.1	3.8	4.1	4.2
4. Health Department Pen-		1						1]		1
sion Fund	1894	1.6	1.5	2.3	2.3	2.6	2.7	2.8	3.3	3.9	5.9
5. College of the City of N. Y.			0								
Retirement Fund	1902	8 1	4 5	3 5	3 5	24	2.5	1 1	1.3	1.2	0.9
 6. City of New York Employees' ("Grady") Retirement Fund 7. Department of Street Clean- 	1906	!							0.06		
ing Relief and Pension		l	1	i	l		1	1	ŀ		i
Fund	1911		1					l	0.4	2.4	3.5
8. Supreme Court, First Department, Retirement								ŀ			
Fund	1911	1		l	1	1	l	0.1	108	1 4	1.8
9. Supreme Court, Second	1911			ļ	l	l	l	0.1	0.0	*.*	•••
Department, Retirement		l	l	ı	l	l	l	1	l	l	
Fund	1914		 		 	 	 				0.2
Total, All Funds								4.1	4.2	4.6	4.8

The only exception in the above illustrated expansion of pension funds is that of the College of the City of New York, the pensions having decreased during the ten year period from 6.1% to 0.9% of the active payroll. The fund applies, however, to a small service of a little more than 200 members, and is, therefore, open to accidental, irregular fluctuations. Thus, in October, 1915, the pension list was increased and approximately 2.4% of the amount of the active payroll was paid by the fund in pensions.

Fund revenues increased to keep pace with pension demands

The originators of the pension systems were under the impression that they were establishing "self-supporting" funds. This delusion was soon dissipated, however, as the rapidly growing obligations of the funds threatened to wipe out their "reserves" accumulated as a result of the margins of safety allowed in selecting original sources of revenue. The application of new municipal revenues was generally first resorted to. When these became inadequate, the salaries of employees were assessed for the benefit of the funds, and finally, as a last resort to save the older funds from collapsing, legislation was secured to compel the city to provide for annual deficiencies by means of budgetary appropriations and the issue of special revenue bonds.

A general idea of the struggles of the pension funds for increased sources of revenue may be obtained from facts presented in Table 51, opposite page 156. This table shows that the city supported the police and fire pension funds from the date of their establishment in 1857 and 1871, respec-

tively, up to and including the year 1892, out of its miscellaneous revenues. The subsequent inclusion of other forms of revenue and the percentage proportion of total annual receipts of all funds secured from various sources are presented as follows:

	Total Rece	ipte	Per Cent. of Total Receipts Derive Sources Indicated				d from		
Year	Amount	Per Cent.	Em- ployees' Contri- butions	Indirect City Contri- butions	Direct City Contri- butions	Interest	Donations, Bequests, Rewards, etc.		
1893	\$756,420.76	100	8.18	87.51		3.96	.35		
1894	766,752.17	100	12.27	83.62		3.93	.18		
1895	858,871.67	100	11.88	84.11		3.21	.80		
1896	1,319,930.22	100	8.24	89.27		2.32	.17		
1897	1,431,722.53	100	11.00	85.78		2.93	.29		
1898	1,571,414.05	100	13.69	82.62		3.52	.17		
1899	1,687,450.89	100	14.88	80.58		3.93	.61		
1900	1,757,267.72	100	13.15	82.50	••••	4.12	.23		
1901	1.708.094.58	100	13.25	82.21		4.36	.18		
1902	1,835,993.34	100	11.48	84.19		4.13	.20		
1903	1,658,777.87	100	12.98	80.90		5.91	.21		
1904	2,121,721.89	100	10.31	76.01	9.28	4.14	.26		
1905	2,347,196.86	100	12.54	75.74	8. 26	3.36	.10		
1906	2,853,847.80	100	14.72	68.30	14.02	2.80	.16		
1907	2,972,642.96	100	14.29	68.52	13.46	2.85	.88		
1908	3,152,507.91	100	14.44	69.90	12.69	2.85	.12		
1909	3,223,118.93	100	14.14	70.29	12.41	2.90	.26		
1910	3,288,920.52	100	15.76	62.03	18.24	2.82	1.15		
1911	3,694,600.95	100	14.55	60.02	23.02	2.16	.25		
1912	4,381,728.13	100	15.69	53.20	28 .85	2.13	. 13		
1913	4,801,884.06	100	14.75	52.51	30.72	2.00	.02		
1914	5,342,507.65	100	14.13	52.47	31.15	2.22	.03		

During the 59 years of past pension legislation, hardly a year passed without some new revenue being thought of as a convenient source of income to one or the other of the fast growing pension funds. The multitude of the present sources is shown in the chart opposite page 4. The amounts realized by the combined nine pension funds from each of these sources since their establishment and during the year 1914 are presented in the following tabulation.

¹ Compiled from Table 51, opposite page 156.

RECEIPTS OF CITY'S PENSION FUNDS, BY SOURCES Summary of Totals for the Years 1857 to 1914 and for the Year 1914

	1857 to 19)14	1914	
Source of Receipts	Amount	Per Cent. of Total Receipts	Amount	Per Cent. of Total Receipts
1—Employees' Contributions	\$ 7,349,058.1 3	12.24	\$ 754,7 2 4. 3 8	14.13
2—Direct City Contributions Budgetary Appropriations Special Revenue Bonds	7,845,448.58 6,891,448.84 953,999.74	13.07 11.48 1.59	1,664,552.36 1,450,000.00 214,552.36	31.15 27.14 4.01
3—Indirect City Contributions	42,255,968.12	70.39	2,803,058.60	52.47
Absence Deductions, Fines, etc., from Employees.	9,934,385.55	16.55	737,271.65	13.80
Unexpended Balances of Appropriations Sales of Condemned De- partmental Property, Unclaimed Cash and Sales of Unclaimed	3,114,936.85	5.19	122,171.75	2.29
Sales of Unclaimed Property Excise Licenses Boiler Inspection Certifi-	491,380.13 21,562,264.52	.82 35.92	32,973.92 1,333,247.61	.61 24.96
cates	616,804.12 301,395.00 71,236.50	1.03 .50 .12	24,768.00 8,445.00 4,349.50	.46 .16 .08
Coal Law	2,44 5.00			
Agricultural Law Identification Card Fees "Fire Prevention" Li-	28,740.11 204.30	.05	14.50	•••••
censes and Penalties Sale of Seized Combusti-	2,746,494.44	4.58	132,289.28	2.48
bles Foreign Fire Insurance	551.19		• • • • • • • • • • • • • • • • • • • •	
Tax	2,096,411.16	3.49	145,361.81	2.72
Incumbrances Sale of Refuse and Gar- bage, Scow Trimming	17,503.17	.03	4,965.81	.09
and Dumping Privi- leges Penalties for Violation of	231,641.82	.38	166,250.77	3.11
Sanitary Code Searches, Transcripts of Births, Marriages and	419,675.23	.70	66,599.00	1.25
DeathsPremium on Bonds Sold	163,649.42	.27		••••
and Discount on Bonds Purchased	79,838.05	.13	24,350.00	.46
Balances at Consolidation of Other Funds	376,411.56	.63		••••
4—Donations, Bequests, Rewards, etc	3 05,84 6 . 40	.51	1,578.01	.03
5—Interest	2,271,951.22	3.79	118,594.30	2.22
Total Receipts	\$ 60,028,272.45	100.00	\$ 5,342,507.65	100.00

Indirect city contributions delay reorganization

Of main significance in the data presented in the preceding tabulation is the fact that \$42,000,000, or 70% of the total \$60,000,000 absorbed by the nine funds since their establishment, was diverted from its course to the city treasury without public realization of the full extent of the transaction.

The constant extension and liberalization of the city's pension policy in the past is directly due to the comparative ease with which its pension funds secured cash through indirect methods, apparently imposing no burden either on the taxpayer or on the beneficiary. It is obvious that the city would have revised its pension provisions long ago if the amounts it indirectly contributed had appeared in the annual budgets as direct appropriations clearly labeled "for pensions." In the meantime, the promises of liberal benefits incorporated in the pension laws during the period of earlier pension prosperity have begun to develop into constantly increasing maturing claims. Only since 1904, when the police fund began slowly to emerge from under the cover of indirect support and make demands upon direct budgetary appropriations, has the public had a fair opportunity to acquaint itself with the possibilities for rapid expansion of uncalculated and loosely administered pension systems.

Without decreasing the proportion of its support, the city has gradually changed the sources of revenue. While in the earlier days the city's contributions were made up entirely from indirect sources, in 1914, as shown in the tabulation on page 53, of the total receipts of \$5,342,507, the city contributed indirectly 52.47%, or \$2,803,058, while 31.15%, or \$1,664,552, was made available through direct budgetary appropriations and the issue of special revenue bonds. The city's total support in 1914 amounted, therefore, to \$4,467,610, or 83.62% of the total receipts of the nine pension funds.

The proportion of the income of the nine pension funds in 1914 derived from indirect city contributions is indicated below:

	Total	Indirect City Co	ntributions
Pension Fund	Receipts in 1914 from all Sources	Amount	Per Cent. of Total Receipts
1. Police Pension Fund	\$2,452,013.53	\$679,616.26	27.72
2. Fire Department Relief Fund	1,055,381.64	821,266.93	77.82
3. Teachers' Retirement Fund	1,077,142.64	746,003.92	69.26
4. Health Department Pension Fund	94,085.09	66,599.00	70.79
5. College of the City of New York Retirement Fund	127.14		
("Grady") Retirement Fund	96,663.26	96,663.26	100.00
 Department of Street Cleaning Relief and Pension Fund	549,233.63	388, 363 .8 5	70.71
tirement Fund	16,960.72	4,545.38	26.80
9. Supreme Court, Second Department, Retirement Fund	900.00		
Total, All Funds	\$5,342,5 07.65	\$ 2,803,058. 60	52.47

¹ Compiled from Table 53, opposite page 156.

Excise moneys

The largest single source of the city's indirect support is a proportion of the city's share of excise moneys. As shown in the table on page 53, \$21,562,264 of excise license moneys was paid to the pension funds in the past. In 1914, a total of \$1,333,247, or 24.96% of the total receipts of all nine funds, accrued in this manner.

The proportion of receipts of the five pension funds in 1914, derived from excise moneys under the legal provisions set forth in the chart opposite page 4, was as follows:

	Total Receipts	Receipts from Excise Licenses		
Pension Fund	in 1914 from all Sources	Amount	Per Cent. of Total Receipts	
Police Pension Fund. Fire Department Relief Fund. Teachers' Retirement Fund. College of the City of New York Retirement Fund. City of New York Employees' ("Grady") Retirement Fund. Total.	\$2,452,013.53 1,055,381.64 1,077,142.64 127.14 96,663.26 \$4,681,328.21	\$430,000.00 525,000.00 281,584.35 	17.54 49.75 26.14 100.00	

¹ This fund is entitled to 1% of the city's share of excise moneys "as needed," which it receives from time to time. A payment of \$10,000 was made to the fund in 1913. The \$127.14 received in 1914 is interest on bank deposits.

The total receipts of the city from excise licenses have been decreasing since 1910, and in view of recently imposed restrictions are expected to decline still further in the future. The funds of the fire department and the department of education, which are entitled to a fixed percentage of the net excise receipts, therefore derive decreasing amounts from this source. The police fund is unaffected, as its share is limited to a fixed annual amount of \$430,000. The fund of the City College has not developed as yet the need for its maximum share of 1% of the net receipts. The fund operating under the "Grady Law" is not restricted in its demands on the excise moneys either to a definite amount or to a fixed proportion of the total receipts.

To facilitate an understanding of these somewhat complicated conditions, and to afford an idea of the future sufficiency of excise moneys as a source of revenue for the five pension funds, the following statement for the years 1910 to 1914 is presented:

			Amounts Paid to City's Pension Funds					
Year	City's Net Receipts from Excise Licenses	Police Pension Fund	Fire Department Relief Fund	Teachers' Retirement Fund	College of the City of New York Retirement Fund	City of New York Employees' ("Grady") Retirement Fund		
1910 1911 1912 1913 1914	\$5,836,063.26 5,731,593.57 5,683,597.58 5,631,687.16 5,523,381.50	\$430,000.00 430,000.00 430,000.00 430,000.00 430,000.00	\$438,039.40 555,450.35 546,862.28 545,565.46 525,000.00	\$291,803.16 286,579.67 284,212.31 281,584.35 276,169.071	\$10,000.00 10,000.00	\$3,083.28 8,253.56 25,419.95 30,980.05 96,712.32 ¹		

¹The amounts credited to the Teachers' and "Grady" funds differ slightly from those shown in the preceding statement. This is due to bookkeeping differences, as the two statements have been compiled from different sources.

Employees' fines and absence deductions

The next largest indirect source of revenue consists of the amounts of disciplinary and absent time deductions from the salaries of employees. The tabulation on page 53 shows that \$9,934,385.55, or 16.55% of the total receipts of all funds since their establishment, were derived from this source. In 1914 the amount was \$737,271.65 and the percentage 13.80%.

Because of the prevailing tendency to regard these deductions from payrolls as contributions of employees, it is pertinent to point out that their principal object is the enforcement of discipline, and they would have been made even were there no pension funds in existence. The amounts deducted would have been utilized in reducing direct taxation, and their present payment into the pension funds is therefore considered as an indirect and therefore highly undesirable city contribution.

Four pension funds derive a part of their income from this source, as shown in the following statement for the year 1914:

	Total Receipts	Receipts from Disciplinary and Absent Time Deduc- tions from Payrolls		
Pension Fund	in 1914 from all Sources	Amount	Per Cent. of Total Receipts	
Police Pension Fund	\$2,452,013.53 1,055,381.64 1,077,142.64 549,233.63	\$174,137.56 7,883.83 464,419.57 90,830.69	7.10 .75 43.12 16.54	
Total	\$5,133,771.44	\$737,271.65	14.36	

Unexpended balances of appropriations

Particularly vicious in principle are legal provisions authorizing the use of unexpended balances, as they put a premium on "padding" estimates for salary appropriations. In the police department since 1886, in the street cleaning department, and in the Supreme Court, First Department, since 1912, substantial amounts have been transferred to the corresponding pension funds in this manner, as shown in the following statement:

	Unexpended Balances of Salary Appropriations Paid Pension Funds						
Year	Total	Police Pension Fund	Department of Street Cleaning Relief and Pension Fund	Supreme Court, First Department, Retirement Fund			
1886	\$114,287.42 104,442.73 45,000.36 90,405.59 116,356.29	\$114,287.42 104,442.73 45,000.36 90,405.59 116,356.29					
1891	34,968.68 69,295.39 104,022.92 88,055.05 53,496.33	34,968.68 69,295.39 104,022.92 88,055.05 53,496.33					
1896	370,295.35 103,686.13 76,769.71 54,846.39 219,495.67	370,295.35 103,686.13 76,769.71 54,846.39 219,495.67					
1901 1902 1903 1904	30,610.56 173,410.77 99,487.89 25,918.81 16,531.05	30,610.56 173,410.77 99,487.89 25,918.81 16,531.05					
1908	99,619.68 166,485.11 319,538.48 250,846.43 88,367.99	99,619.68 166,485.11 319,538.48 250,846.43 88,367.99					
1911	2,955.43 37,307.43 36,261.06 122,171.75	2,955.43 3,870.04 29,542.62	\$35,254.40 30,582.70 88,083.75	\$2,053.03 1,808.32 4,545.38			
Total	\$ 3,114,936.85	\$2,952,609.27	\$153,920.85	\$8,406.73			

Employees contribute since 1893

The employees contribute a fixed percentage of their salaries to five of the city's pension funds, as follows:

Pension Fund	Per Cent. of Salary	Date When Contributions Began
Police Pension Fund		1893 1896 to 1901 from Brooklyn teachers, since 1905 from all teachers
Health Department Pension Fund Department of Street Cleaning Relief and	1%	1907
Pension Fund	3%	1911
Supreme Court, First Department, Retirement Fund	1%	1913

In 1914 the city's pension funds derived the following proportions of their income from contributions of employees:

	Total	Employees' (contributions
Pension Fund	Receipts in 1914 from All Sources	Amount	Per Cent. of Total Receipts
Police Pension Fund Fire Department Relief Fund	\$2,452,013.53 1,055,381.64	\$315,253.05	12.86
3. Teachers' Retirement Fund		285,257.52	26.48
4. Health Department Pension Fund	94,085.09	13,393.19	14.23
5. College of the City of New York Re-	,	ŕ	
tirement Fund	127.14		•••••
("Grady") Retirement Fund	96,663.26		
7. Department of Street Cleaning Relief	00,000.20		************
and Pension Fund	549,233.63	134,734.06	24.53
8. Supreme Court, First Department,			
Retirement Fund	16,960.72	6,086.56	35.89
9. Supreme Court, Second Department,			
Retirement Fund	900.00	• • • • • • • • • • • • • • • • • • • •	•••••
Total	\$5,342,507.65	\$754,724.38	14.13

Salary assessments have been imposed upon employees from considerations of expediency rather than in full recognition of the advantages to be gained from the operation of equitable contributory systems. The return of contributions in case of an employee's dismissal, resignation or death is one of the most advantageous features of a contributory plan. Besides giving the contributors a sense of security, it facilitates the discharge of inefficient employees before they become eligible to retirement, and reduces the necessity for pensions to the dependents of deceased employees whose death is not caused in the performance of duty. These advantages are not realized, as none of the city's pension funds makes provision for refunds. The only exception is the teachers' retirement fund, where contributions without

interest are returned to discharged teachers. Since teachers, however, are rarely discharged, this exception has no practical application.

The assessment of a flat percentage of salary, on all employees irrespective of sex, age at entrance into the service, and the fact that some become eligible to benefits after having contributed little or nothing to a newly established fund, is an obviously crude arrangement, lacking all elements of equity.

The employees' contributions, fixed as they are at a uniform percentage of salary, provide a constantly decreasing proportion of the annually maturing pension claims which rise each year to a larger percentage of the active payroll, as shown in the statement on page 51.

In 1914 the employees' contributions were sufficient to pay the following proportions of pension demands upon the various funds:

	Pensions Pa	aid in 1914	Percentage of Active Payroll		
Pension Fund	Amount	Per Cent. of Active Payroll	Contributed by Employees	Paid from Other Fund Revenues	
Police Pension Fund	\$2,456,805.13	16.16	2	14.16	
Teachers' Retirement Fund	1,183,397.08	4.15	1 1	3.15	
Health Department Pension Fund		5.92	l ī	4.92	
Department of Street Cleaning		0.02	_		
. Relief and Pension Fund	163.053.71	3.49	3	0.49	
Supreme Court, First Depart-		0.20		0.20	
ment. Retirement Fund	10,822.80	1.78	1 1	0.78	

Direct taxation resorted to since 1904

In the police pension fund since 1904¹ and the fire department relief fund since 1912, annual deficiencies have been covered by means of direct budget-ary appropriations and the issue of special revenue bonds. The fund of the Supreme Court, First Department, has derived, since its establishment in 1911, a part of its income from direct taxation. The pension granted from the Supreme Court, Second Department, retirement fund has been paid entirely by means of special revenue bonds.

These direct city contributions to the four funds were as follows:2

¹ Mandatory provision requiring the city to cover deficiencies in the police pension fund was passed in 1892 (chapter 539). The then exhausted condition of the fund was subsequently relieved, however, by a 2% assessment on salaries of policemen since 1893, and the reversion to the fund of an unexpended balance of appropriation in 1896 amounting to \$370,295.33. The increased revenues provided only temporary relief, as they became entirely inadequate to pay the constantly increasing pension roll, and in 1904 the first direct budgetary appropriation was made to enable the fund to meet its current obligations.

² Compiled from Tables 54 and 55, opposite page 156; and Tables 61 and 62 on pages 162 and 163.

	Amounts Paid to Funds Through Budgetary Appropriations and Special Revenue Bonds					
Year	Police Pension Fund	Fire Department Relief Fund	First Dept.	Supreme Court, Second Dept., Retirement Fund		
1904 1905 1908 1907 1908 1909 1910 1911 1912 1913 1914	\$197,000.00 193,946.26 400,000.00 400,000.00 400,000.00 600,000.00 850,000.00 1,135,188.22 1,320,538.34 1,450,000.00	\$127,097.60 149,741.70 207,374.94	\$499.98 2,000.00 4,884.12 6,277.42	\$900.00		
Total	\$7,346,672.82	\$484,214.24	\$13,661.52	\$900.00		

The proportion of the income of the four pension funds in 1914 derived from direct city contributions was as follows:

	Total	Direct City Contributions	
Pension Fund	Receipts in 1914 from All Sources	Amount	Per Cent. of Total Receipts
Police Pension Fund	\$2,452,013.53 1,055,381.64	\$1,450,000.00 207,374.94	59.13 19.65
ment Fund	16.960.72	6,277.42	37.01
Supreme Court, Second Department, Retirement Fund.	900.00	900.00	100.00

Donations and interest provide insignificant part of income

The receipt of donations, gifts and bequests by the pension funds of the departments of police, fire, education and street cleaning is specifically sanctioned by law (see statement opposite page 4). The entire income from this source in the past amounted to \$305,846.40. In 1914 it was \$1,578.01.

Interest on investments and bank deposits was an important part of the income in the earlier days, when the older funds were in the accumulative stage of development, as may be seen from the data presented in Table 51, opposite page 156. With the gradual exhaustion of the funds, however, this source of revenue decreased, and since 1906 netted less than 3% of the total annual income. In the pension funds of the departments of fire and education, interest is derived from permanent funds of about \$800,000 each, set aside

¹ Compiled from Table 53, opposite page 156.

in 1904 and 1905, respectively, the law stipulating that they shall not be encroached upon for the payment of annual deficiencies.

The small proportion of the income of the nine pension funds in 1914 derived from the above mentioned sources is indicated in the following statement:

	Total	Donations, Bequests, etc.		Interest	
Pension Fund	Receipts in 1914 from All Sources	Amount	Per Cent. of Total Receipts	Amount	Per Cent. of Total Receipts
1. Police Pension Fund 2. Fire Department Relief Fund 3. Teachers' Retirement Fund.		704.90	.03	\$6,275.11 26,034.87 45,881.20	.26 2.46 4.26
4. Health Department Pension Fund 5. College of the City of N. Y. Retirement Fund	94,085.09		••••	14,092.90	14.98
6. City of New York Employ- ees' ("Grady") Retire- ment Fund	96,663.26			127.142	100.00
ing Relief and Pension	549,233.63	4.00		26,131.72	4.76
8. Supreme Court, First De- partment, Retirement Fund 9. Supreme Court, Second De-	16,960.72			51.36	.30
partment, Retirement Fund					
Total	\$5,342,507.65	\$1,578.01	.03	\$118,594.30	2.22

Receipts and disbursements of individual funds

Detailed statements of receipts and disbursements for each of the city's nine pension funds are presented in Tables 54 to 62, opposite pages 156 to 163. Summaries of totals by sources of receipts and objects of expenditures since establishment, and during the year 1914, are set forth in Tables 52 and 53 opposite page 156. The following statements show the total transactions of the funds in the past and during the year 1914:

¹ Compiled from Table 53, opposite page 156.

³ The fund of the City College draws on the city's share of excise moneys as needed up to a maximum of 1% during any one year. In 1914 no excise moneys were drawn upon and the total increment to the fund consisted of interest on its balance from the preceding year.

RECEIPTS, DISBURSEMENTS AND BALANCES OF PENSION FUNDS SINCE ESTABLISHMENT

Pension Fund	Year Established	Total Receipts	Total Disbursements	Balances Dec. 31, 1914
1. Police Pension Fund	1857	\$32,193,598.26	\$32,192,866.16	\$732.10
2. Fire Department Relief	1871	14,080,249.19	13,228,628.01	851,621.18
3. Teachers' Retirement Fund	1894	11,308,146.65	10,401,541.08	906,605.57
4. Health Department Pension Fund	1894	806,855.50	472,543.88	334,311.62
5. College of the City of N.Y. Retirement Fund	1902	128,843.76	125,896.15	2,947.61
6. City of New York Employees' ("Grady") Retirement Fund 7. Department of Street	1906	171,302.78	171,302.78	1
Cleaning Relief and Pension Fund	1911	1,306,930.75	300,630.58	1,006,300.17
8. Supreme Court, First Department, Retirement Fund	1911	31, 44 5.56	22,068.25	9,377.31
Department, Retirement Fund	1914	900.00	900.00	
Total		\$60,028,272.45	\$56,916,376.89	\$3,111,895.56

RECEIPTS AND DISBURSEMENTS OF PENSION FUNDS IN 1914

Pension Fund	Receipts	Disbursements	Surplus (+) or Deficit (-)
 Police Pension Fund Fire Department Relief Fund Teachers' Retirement Fund Health Department Pension Fund College of the City of N. Y. Retirement Fund City of New York Employees' ("Grady") Retirement Fund Department of Street Cleaning Relief and Pension Fund Supreme Court, First Department, 	\$2,452,013.53 1,055,381.64 1,077,142.64 94,085.09 127.14 96,663.26 549,233.63	\$2,458,289.13 1,058,561.96 1,184,208.12 79,487.90 4,325.00 96,663.26 166,373.44	- 6,275.60 - 3,180.32 - 107,065.43 + 14,597.19 - 4,197.86
9. Supreme Court, Second Department, Retirement Fund	16,960.72 900.00	10,822.80 900.00	+ 6,137.92
Total	\$5,342,507.65	\$5,059,631.61	+\$282,876.04

¹The retirement funds for the City of New York ("Grady") employees' and the Supreme Court, Second Department, are not funds within the strict meaning of this term. The Pension demands are met currently by the city from excise moneys and by direct city appropriation, respectively, no balances remaining in the funds for accumulation at interest.

"Unlimited" funds draw increasing part of income from direct taxation

The present nine pension funds of the city may be divided into two groups, according to the extent of their resources. Four of the funds, applicable to the uniformed forces of the departments of police and fire and the employees of the Supreme Courts, First and Second Departments, are practically unlimited in their incomes. According to present laws, the city is obligated to supply the necessary amounts through direct taxation when other fund revenues prove insufficient to meet current obligations. The remaining five funds are limited to incomes from definite sources.

The gradually increasing claims on the city's direct support made by "unlimited" funds in the past is presented separately for each fund in the following statements.

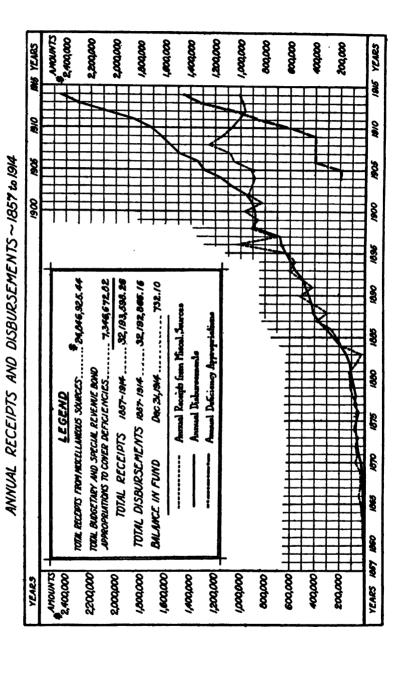
Police pension fund

The transactions of the police pension fund are shown in detail in Table 54, opposite page 156. A graphic illustration of the relation of annual revenues to expenditures is presented in the chart on page 64.

The solid or "pension" line in this chart indicates the annual amounts expended for pensions which increased from \$30 in 1858 to \$2,458,298.13 in 1914. The dotted or "revenue" line shows the annual revenues of the fund received from all sources except direct taxation. The amounts made available by multiplying these sources became more and more inadequate to keep pace with the unrelenting growth of maturing pension demands. In 1904 the fund got permanently under the load. Its accumulations of prior years exhausted, the fund was enabled to keep its obligations to pensioners only by having its annually growing deficits covered out of the general tax levy. The additional or "deficit" line on the chart, drawn by means of dashes and circles, shows the rapid rise of these annual deficits from \$197,000 in 1904 to \$1,450,000 in 1914. A summary of the annual financial transactions of the fund since 1857 is presented on page 65.

COMMISSION ON PENSIONS CITY OF NEW YORK

POLICE PENSION FUND

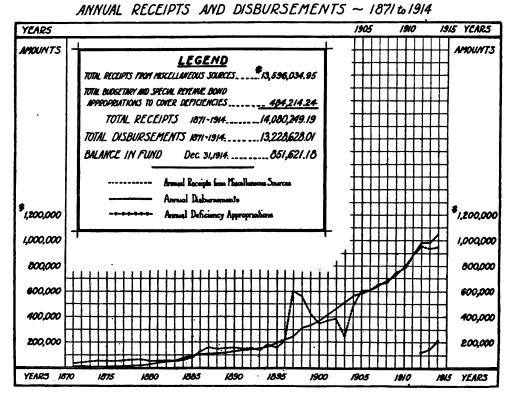


	Receip	ts from			
Year	All Sources Except Direct Taxation	Direct Taxation	Disburse- ments	Surplus (+) or Deficit (-)	Balance December 31
1857 1858 1859 1860	\$423.10 2,200.00 3,646.37 5,021.08		\$30.00 240.00 809.31	+\$423.10 +2,170.00 +3,406.37 +4,211.77	\$423.10 2,593.10 5,999.47 10,211.24
1861	10,050.15 10,065.59 9,203.05 19,801.62 26,479.19		1,475.03 2,133.32 2,398.58 3,906.59 6,680.72	+8,575.12 +7,932.27 +6,804.47 +15,895.03 +19,798.47	18,786.36 26,718.63 33,523.10 49,418.13 69,216.60
1866 1867 1868 1869	44,465.30 31,456.63 32,100.11 36,124.78 73,523.22		7,257.50 7,965.04 13,676.13 19,483.64	+37,207.80 +23,491.59 +18,423.98 +16,641.14	106,424.40 129,915.99 148,339.97 164,981.11
1871 1872 1873 1874	58,473.56 68,630.64 56,113.80 80,776.92 65,376.00		26,452.95 45,675.21 56,954.03 61,434.38 72,941.30 62,214.08	+47,070.27 +12,798.35 +11,676.61 -5,320.58 +7,835.62 +3,161.92	212,051.38 224,849.73 236,526.34 231,205.76 239,041.38 242,203.30
1876 1877 1878 1879	60,909.16 64,939.55 91,715.29 114,293.55 113,869.56		44,596.73 77,259.90 67,574.54 80,270.28 97,916.13	+16,312.43 -12,320.35 -24,140.75 +34,023.27 +15,953.43	258,515.73 246,195.38 270,336.13 304,359.40 320,312.83
1881 1882 1883 1884	117,696.90 64,312.35 26,410.60 183,545.49 229,366.42		105,308.15 115,928.23 143,120.49 186,981.42 248,114.83	+12,388.75 -51,615.88 -116,709.89 -3,435.93 -18,748.41	332,701.58 281,085.70 164,375.81 160,939.88 142,191.47
1886 1887 1888 1889	269,783.60 385,071.23 294,829.54 417,152.41 516,236.79		304,418.09 368,367.95 413,976.65 424,630.84 451,349.36	$\begin{array}{r} -34,634.49 \\ +16,703.28 \\ -119,147.11 \\ -7,478.43 \\ +64,887.43 \end{array}$	107,556.98 124,260.26 5,113.15 -2,365.28 62,522.15
1891 1892 1893 1894 1895	416,810.88 522,742.82 608,008.67 562,112.70 618,661.14		480,550.34 509,393.15 563,469.92 594,884.08 636,499.68	-63,739.46 +13,349.67 +44,538.75 -32,771.38 -17,838.64	-1,217.31 12,132.36 56,671.11 23,899.73 6,061.19
1896 1897 1898 1899 1900	1,034,058.78 709,752.60 908,491.13 867,996.56 967,473.41		671,404.03 684,320.90 892,789.08 879,833.38 886,947.87	+362,654.75 +25,431.70 +15,702.05 -11,836.82 +80,525.54	368,715.94 394,147.64 409,849.69 398,012.87 478,538.41
1901	826,678.23 940,205.57	\$197,000.00 193,946.26	906,035.20 951,111.31 1,073,150.79 1,158,219.93 1,299,275.97	-79,356.97 -10,905.74 -162,598.46 -76,523.82 -200,468.25	399,181.44 388,275.70 225,677.24 149,153.42 -51,314.83
1906	1,057,556.86 1,085,118.19 1,255,873.63 1,148,498.28 1,068,953.57	400,000.00 400,000.00 400,000.00 400,000.00 600,000.00	1,342,522.05 1,498,311.37 1,568,894.26 1,634,587.53 1,723,614.61	+115,034.81 -13,193.18 +86,979.37 -86,089.25 -54,661.04	63,719.98 50,526.80 137,506.17 51,416.92 -3,244.12
1911	1,023,878.34 962,164.57 975,702.53 1,002,013.53	850,000.00 1,135,188.22 1,320,538.34 1,450,000.00	1,852,647.27 2,089,614.03 2,314,958.88 2,458,289.13	+21,231.07 +7,738.76 -18,718.01 -6,275.60	17,986.95 25,725.71 7,007.70 732.10
Total	\$24,846,925.44	\$7,346,672.82	\$32,192,866.16	+\$732.10	

Fire Department Relief Fund

The financial transactions of the fire department relief fund, presented in detail in Table 55, opposite page 156, resemble those of the police pension fund. The accumulation of surpluses in the earlier years of operation was followed by a period of annual deficiencies which would have completely exhausted the fund had the legislature not sequestered the balance of the fund on May 3, 1904, as a permanent "reserve" fund. The insufficiency of the regular statutory income led, as in the case of the police pension fund, to unlimited support of the fund by the city. The city's direct contributions, in the form of special revenue bonds, began in 1912 and have increased annually. The expansion of the fund is presented in the chart below. It is interesting to compare this chart with a similar chart for the police pension fund on page 64.

CITY OF NEW YORK
COMMISSION ON PENSIONS
FIRE DEPARTMENT RELIEF FUND



The following is a summary of the annual financial transactions of the fund since 1871, the year of its establishment:

	Receipt	s from		Surplus (+)	
Year	All Sources Except Direct Taxation	Direct Taxation	Disburse- ments	Or Deficit (—)	Balance December 31
1871	\$35,257.76 42,525.14 49,641.01 60,242.07 59,689.07		\$6,856.42 13,737.40 3,042.59 4,194.70 4,029.64	+\$28,401.34 +28,787.74 +46,598.42 +56,047.37 +55,659.43	\$28,401.34 57,189.08 103,787.50 159,834.87 215,494.30
1876 1877 1878 1879 1880	55,502.85 62,998.97 64,910.65 68,540.62 54,696.44		5,089.76 6,426.63 16,083.56 17,278.37 27,192.63	+50,413.09 +56,572.34 +48,827.09 +51,262.25 +27,503.81	265,907.39 322,479.73 371,306.82 422,569.07 450,072.88
1881 1882 1883 1884 1885	56,907.88 57,880.77 57,295.93 64,205.41 83,168.75		37,478.23 48,222.32 55,195.86 77,862.55 90,505.00	+19,429.65 +9,658.45 +2,100.07 -13,657.14 -7,336.25	469,502.53 479,160.98 481,261.05 467,603.91 460,267.66
1886 1887 1888 1889	132,612.64 169,762.79 155,891.28 159,070.06 162,763.76		103,302.46 111,925.02 114,939.29 121,091.21 131,042.65	+29,310.18 +57,837.77 +40,951.99 +37,978.85 +31,721.11	489,577.84 547,415.61 588,367.60 626,346.45 658,067.56
1891 1892 1893 1894	156,953.65 160,764.24 148,412.09 175,662.53 161,241.27		138,715.76 146,226.67 157,793.59 170,686.27 197,194.08	+18,237.89 +14,537.57 -9,381.50 +4,976.26 -35,952.81	676,305.45 690,843.02 681,461.52 686,437.78 650,484.97
1896 1897 1898 1899	212,091.10 601,145.36 564,728.17 424,560.90 358,987.56		223,838.04 250,803.91 317,554.18 338,414.99 372,649.90	$\begin{array}{r} -11,746.94 \\ +350,341.45 \\ +247,173.99 \\ +86,145.91 \\ -13,662.34 \end{array}$	638,738.03 989,079.48 1,236,253.47 1,322,399.38 1,308,737.04
1901 1902 1903 1904	373,113.11 387,512.77 244,957.17 485,578.84 600,813.29		421,177.15 470,133.31 516,402.90 558,074.14 581,757.47	-48,064.04 -82,620.54 -271,445.73 -72,495.30 +19,055.82	1,260,673.00 1,178,052.46 906,606.73 834,111.43 853,167.25
1906 1907 1908 1909	606,053.69 659,170.84 672,151.67 729,379.24 790,843.86		606,108.31 649,248.59 684,062.43 729,159.76 792,218.08	-54.62 +9,922.25 -11,910.76 +219.48 -1,374.22	853,112.63 863,034.88 851,124.12 851,343.60 849,969.38
1911 1912 1913 1914	881,789.52 859,817.82 838,735.71 848,006.70	\$127,097.60 149,741.70 207,374.94	880,475.28 986,044.78 985,830.17 1,058,561.96	+1,314.24 +870.64 +2,647.24 -3,180.38	851,283.62 852,154.26 854,801.50 851,621.18
Total	\$13,596,034.95	\$484,214.24	\$13,228,628.01	+\$851,621.18	

Supreme Court, First Department, retirement fund

This fund operates on a somewhat different basis than the funds of the police and fire departments. The law regulating the income of the fund is vague and allows varied interpretation. The pension payments were made in 1911 from a special revenue bond appropriation. In 1912 only part of the obligations was paid from a direct appropriation, the balance being provided for from the Supreme Court's salary accounts. In 1913 a fund was established and a 1% assessment on salaries of employees added as a new source of revenue. At present the employees' contributions are accumulated at interest, and pensions are paid partly from salary appropriations and partly from budgetary pension appropriations. The details of this fund's growth are presented in Table 61, page 162. A summary of the transactions follows:

	Receipt	s from			
Year	All Sources Except Direct Taxation	Direct Taxation	Disburse- ments	Surplus	Balance December 31
1911 1912 1913 1914	\$2,053.03 5,047.71 10,683.30	\$499.98 2,000.00 4,884.12 6,277.42	\$499.98 4,053.03 6,692.44 10,822.80	\$3,239.39 6,137.92	\$3,239.39 9,377.31
Total	\$17,784.04	\$13,661.52	\$22,068.25	\$9,377.31	

Supreme Court, Second Department, retirement fund

No fund in the ordinary sense of the word is maintained for this branch of the service. The pensions are paid by the issue of special revenue bonds, and amounted in 1914 to \$900.00.

"Limited" funds in varying degrees of expansion

Five of the city's pension funds are restricted in their income to definite sources, as set forth in detail opposite page 4. The inadequacy of these sources has produced the present difficult situation in the teachers' fund. In other funds different degrees of expansion have been reached, but no immediate critical condition has yet developed.

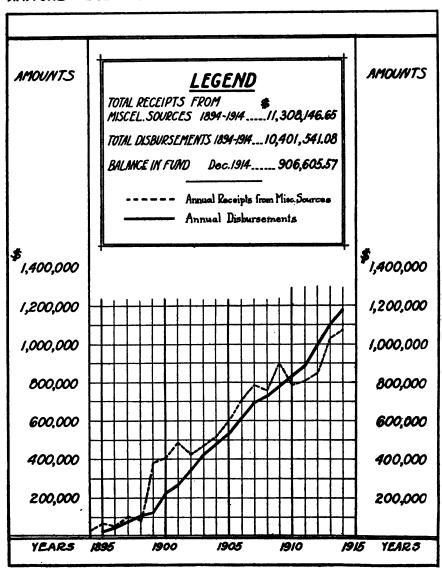
Teachers' retirement fund

The details of the financial transactions of this fund in the past are shown in Table 56, page 157. The chart on page 69 graphically illustrates the long period of accumulation of funds and the subsequent short period of their

CITY OF NEW YORK COMMISSION ON PENSIONS

TEACHERS' RETIREMENT FUND

ANNUAL RECEIPTS AND DISBURSEMENTS~ 1894 to 1914



dissipation for annual deficiencies. The following summary presents the gradual development of the fund. It must be noted that according to a law passed in 1905, a reserve capital of \$800,000, which is included in the balances shown below, has been established and may not be drawn upon to satisfy current pension obligations.

Year	Receipts	Disbursements	Surplus (+) or Deficit (-)	Balance December 31
1894	\$25,060.33	A10.000.04	+\$25,060.33	\$25,060.33
1895	62,897.08	\$12,633.34	+50,263.74	75,324.07
1896	50,504.04	42.595.07	+7.908.97	83,233.04
1897	107.628.38	71.539.49	+36.088.89	119,321.93
1898	83,800.37	102,157.04	-18.356.67	100.965.26
1899	381.579.11	124,296.18	+257.282.93	358.248.19
1900	408.038.59	214.563.57	+193.475.02	551.723.21
1800	200,000.00	214,000.01	T190,470.02	001,720.21
1901	485.108.49	263,805,28	+221.303.21	773,026,42
1902	425.767.18	343.017.13	+82,750.05	855,776.47
1903	468.060.22	420.026.99	+48.033.23	903.809.70
1904	516.003.28	477,418.74	+38,584.54	942,394.24
1905	597.048.00	526,502.36	+70.545.64	1.012.939.88
1800	051,020.00	020,002.00	T10,020.02	1,012,909.00
1906	706.072.85	616.984.54	+89.088.31	1.102.028.19
1907	784,354.89	689,390.64	+94,964.25	1.196.992.44
1908	760,176.05	724.129.78	+36.046.27	1.233.038.71
1909	898,208.84	777.941.85	+120.266.99	1.353.305.70
1910	786,340.54	834.483.49	-48.142.95	1.305.162.75
	100,020.01	001,100.10	- 40,140.00	1,000,102.10
1911	803,734.45	881.071.98	-77.337.53	1,227,825.22
1912	849.198.48	983.972.19	-134,773.71	1.093.051.51
1913	1,031,422.841	1.110.803.30	-79.380.46	1,013,671.05
1914	1,077,142.64	1,184,208.12	-107.065.48	906.605.57
	1,011,112.01	1,101,200.12	107,000.40	200,000.01
Total	\$11,308,146.65	\$10,401,541.08	+\$906,605.57	

Health department pension fund

This fund has been in the accumulative stage during the 21 years of its existence. Its current obligations have in 1915, however, caught up with the current income. The sources of the fund are largely of a stationary nature and the future income will fall below the annual demands. The consequent deficiencies will soon exhaust the present accumulations and a crisis is imminent unless the fund is promptly reorganized.

¹ Includes a \$200,000 advance of excise taxes in this year.

² Includes gross absence deductions. The payment of refunds was delayed due to the critical condition of the fund.

³ This balance contains only \$106,605.57 in excess of the \$800,000 permanent capital. It proved insufficient to cover the fund's shortage in 1915 and resulted in delayed pension payments during the latter part of the year to already retired teachers.

The details of the transactions of this fund are shown in Table 57, page 158. A summary of its development is presented below.

Year	Receipts	Disbursements	Surplus	Balance December 31
1894	\$3,916.61	\$218.85	\$3,916.61	\$3,916.61
1895	16,072.18		15,853.33	19,769.94
1896	23,276.30	1,095.00	22,181.30	41,951.24
1897	13,196.19	2,460.00	10,736.19	52,687.43
1898	14,394.38	4,629.90	9,764.48	62,451.91
1899	13,314.32	7,115.81	6,198.51	68,650.42
1900	22,768.16	7,701.29	15,066.87	83,717.29
1901	23,194.75	10,575.88	12,618.87	96,336.16
	29,261.99	12,138.34	17,123.65	113,459.81
	33,962.26	13,173.29	20,788.97	134,248.78
	37,290.09	16,590.00	20,700.09	154,948.87
1905	49,972.76	18,115.06	31,857.70	186,806.57
	57,222.40	21,205.24	36,017.16	222,823.73
	42,018.67	25,271.78	16,746.89	239,570.62
1908	37,387 . 33	29,698.14	7,689.19	247,259.81
	44,240 . 32	35,804.76	8,435.56	255,695.37
	39,293 . 40	38,870.61	422.79	256,118.16
1911	53,447.16	47,965.81	5,481.35	261,599.51
1912	65,536.39	45,976.73	19,559.66	281,159.17
1913	93,004.75	54,449.49	38,555.26	319,714.43
1914	94,085.09	79,487.90	14,597.19	334,311.62
Total	\$806,855.50	\$472,543.88	\$ 334,311.62	

College of the City of New York retirement fund

This fund, applying as it does to a membership of a little over 200 professors and instructors, presents a typical illustration of the accidental fluctuations which are apt to occur when the law of probabilities has insufficient scope of operation. The pension demands, after a few years of gradual annual increases, have subsequently declined, and in 1914 only \$4,325 was paid out—the smallest annual charge since 1903. In 1915, however, new additions were made to the pension list, substantially increasing the fund's current obligations.

The income of the fund is derived from excise moneys, as needed, not to exceed, however, 1% of the city's share of such moneys in any one year. The needs of the fund in the past have not approximated this maximum limitation, which in 1914 would have amounted to about \$55,000 (see page 56). The inevitable growth of the fund's future obligations will result in increasing drafts on this source of income and at some future period probably exceed the 1% limitation.

The financial statement for this fund appears in Table 58, page 159. Its transactions are summarized as follows:

Year	Receipts	Disbursements	Surplus (+) or Deficit (-)	Balance December 31
1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 Total	\$53,245.83 1,245.89 1,153.55.09 25,442.00 480.37 25,344.23 566.81 280.79 10,178.46 123.13 10,100.45 127.14	\$718.74 13,166.52 17,249.80 16,330.45 13,540.18 11,687.39 12,812.37 9,466.54 10,449.84 4,741.25 5,736.36 5,671.71 4,325.00	+\$52,727.09 -11,920.63 -16,096.23 -15,775.36 +11,901.82 -11,207.02 +12,531.86 - 8,899.73 -10,169.05 + 5,437.21 - 6,613.23 + 4,428.74 - 4,197.86	\$52,527.09 40,606.46 24,510.23 8,734.87 20,636.69 9,429.67 21,961.53 13,061.53 13,061.53 2,892.75 8,329.96 2,716.73 7,145.47 2,947.61

City of New York employees' ("Grady") retirement fund

The pensions under this plan are paid directly from excise taxes. No special fund for the accumulation of a reserve capital at interest is maintained. The annual payments have increased from \$1,500 in 1906 to \$96,-663.26 in 1914, as shown below:

1906	\$1,500.00	1911	\$8,253.64
1907	1,500.00	1912	25,419.95
1908	1,575.00	1913	30,957.13
1909	2,225.44	1914	96,663.26
1910	3 208 36		•

No limitation is set on the amount which may be drawn from excise moneys. The city's receipts from this source amounted in 1914 to \$5,523,-381.50, as shown on page 56. After satisfying the claims of city pension funds, there still remained more than \$4,000,000 to be transferred to the general fund for the reduction of direct taxation. Unless, therefore, additional uses are found for this city revenue, the City of New York employees' retirement fund may expand under present restricted benefit provisions for a great number of years before its annual charge will equal the total of available excise moneys.

Department of street cleaning relief and pension fund

A detailed statement of receipts and disbursements of this fund is presented in Table 60, page 161. The fund is in the early stage of accumulation, its balance amounting to \$1,006,300.17 on December 31, 1914. Its income from all sources during that year constituted almost 12% of the payroll.

Although the income will inevitably decline to a lower percentage in the future, it will still exceed for a number of years the annual pension demands, which were about $3\frac{1}{2}\%$ of the payroll in 1914 and will gradually rise to a higher proportion.

A summary of the fund's expansion during the four years ending December 31, 1914, is presented as follows:

Year	Receipts	Disbursements	Surplus	Balance December 31
1911	\$62,819.40 353,128.94 341,748.78 549,233.63	\$487.27 17,861.62 115,908.25 166,373.44	\$62,332.13 335,267.32 225,840.53 382,860.19	\$62,332.13 397,599.45 623,439.98 1,006,300.171
Total	\$1,306,930.75	\$300,630.58	\$1,006,300.17	• • • • • • • • • • • • • • • • • • • •

¹ This balance does not include the following:

(1) Unexpended balances—salaries and wages, 1914, not received until April, 1915.....

\$90,606.15

(2) Claim against contractor for seew trimming, now in litigation.....

53,311.20

(3) Accrued interest on securities, December 31, 1914.

CHAPTER IV

SUMMARY OF CONCLUSIONS

Present System Expensive and Ineffective

The principal defects in the operation of the present mass of contradicting provisions of the city's nine pension funds may be summarized as follows:

From viewpoint of equity to employees and efficiency of service

- 1. System discriminates between employees in different branches of the service: Employees in different branches of the service are covered by provisions of varying degrees of liberality, generally not justified by differences in the nature of the work performed, but dependent only on participation in a particular fund.
- 2. System discriminates between individual members of each fund: The provisions of each fund give unequal advantages to its members through the operation of crude flat rate pension scales and contributions. The amount of pension does not vary with the length of service. The contributions have no logical relation to benefits receivable.
- 3. Thirty-seven per cent. of city's employees offered inducement to retire in prime of life: Five of the nine pension plans, covering about 37% of the municipal service, permit retirement on demand after short periods of service of from 20 to 30 years, irrespective of the applicant's physical condition and ability to perform his duties efficiently.
- 4. Forty-three per cent. of the service burdened with superannuated employees: Two of the nine pension plans, covering about 43% of the municipal service, do not provide for the adequate relief of the superannuated. There were on June 30, 1914, out of a force of 32,994 employees, 3,323 over 60 years of age who could not be retired even if found unable to do efficient work, because they could not be reached by the inadequate provisions of the plans in question.
- 5. "Excess" pensions expensive and demoralizing to service: The existing scale of half-pay pensions after 20 years of service in the fire and street cleaning departments is unquestionably liberal. Notwithstanding this, pensions of more than one-half of salary have been granted in the discretion of the commissioners of these departments. The favoritism resulting from the use of administrative discretion is made possible by a defective law, and is illustrated by the fact that it has been applied, with few exceptions, to the higher salaried officers of the two forces. One of these "excess" pensions was \$6000 per annum granted to a high official forty-eight years old, after a service of twenty-seven years. Details of other "excess" retirements are presented on pages 32 to 34.

- 6. Re-employment by city of its own pensioners an absurd practice: The present inconsistent law is responsible for the re-employment by the city of its own pensioners and the simultaneous payment to them of pensions and salaries. On June 30, 1914, there were fifty-six policemen and firemen drawing pensions at a total annual rate of \$46,000 and at the same time drawing salaries at an annual rate of \$65,000. A detailed discussion of this phase of the city's pension system occurs on pages 34 to 44.
- 7. Employees inadequately and insecurely provided for in case of injury or death resulting from performance of hazardous duty: Although the city's responsibility for injuries resulting from the performance of duty is obvious, it is recognized only with respect to the fireman, policeman, street cleaner and health department employee. The four pension plans in question provide pensions of different proportions of salary in case of accidents under identical conditions. The widows of employees killed in the performance of duty depend upon administrative discretion for their pensions, which, with the exception of those allowed under the fire department plan, afford meagre protection against want.
- 8. Vague and liberal provisions for disability not caused by performance of duty encourage early retirements: The disability features of the various plans are not uniform in principle and were introduced without study of their possible effect in actual practice. Lack of proper definition and adequate legal and administrative safeguards, as well as high pension scales, encourage the use of disability provisions for early retirement. Of the total annual pension outlay of over \$5,000,000, at the close of 1914 approximately \$2,000,000 was a charge for disability pensions. The problem of providing for disability after it occurs, together with the closely connected and possibly more important problem of instituting preventive measures, through medical entrance examinations and supervision of the health of employees, have not received the thoughtful attention they require.
- 9. Pensioning of dependents of employees whose death is not due to the performance of duty undertaken without realization of financial obligations: Contrary to the general impression of the public, the majority of widows', children's and parents' pensions are granted to dependents of employees whose death was not caused by the performance of duty. Of the 2,453 dependent pensioners on the rolls on December 31, 1914, only 134, or 5.5% of the total number, drew pensions granted as a result of the death of employees in the performance of duty. The principle of pensioning dependents of employees who die from ordinary causes has been adopted in the departments of fire, police and street cleaning. The benefits are granted on the basis of need and other conditions not governed by the value of the deceased employee's service. The continuation of present provisions would probably lead to their adoption by the remaining six pension plans, involving them in heavy financial obligations. The advisability of stimulating voluntary provision by employees for their families through insurance at cost has never been thoroughly considered.

10. Employees' participation in pension cost not general nor uniform, and not based on a consideration of principles involved: In three plans assessments of 1%, in one plan 2%, and in another 3%, of salaries of participating employees are made for the benefit of the fund. The contributing employees provide for but a minor fraction of the cost of their pensions. No assessments are required in the remaining four of the city's pension plans.

From viewpoint of financial soundness

1. Plans launched without knowledge of ultimate cost: Neither at the establishment nor on the occasion of subsequent elaboration of the pension plans have cost calculations been made by qualified actuaries. The increase for a great number of years of the annually maturing claims of a pension system at a more rapid pace than the annual payroll expenditures of the corresponding active force has not been appreciated.

The present total annual pension expenditure of \$5,053,167.84 in 1914, or 4.8% of the city's payroll, will increase to a constantly higher proportion in the future. The fact that no provision is made for the accumulation at interest of adequate reserves to take care of these future increases renders the permanency of existing retirement measures exceedingly doubtful.

- 2. City's support disguised by means of indirect sources of revenue: The bulk of the income of the funds is derived from miscellaneous revenues. The amounts made available in this manner were absorbed by the funds without public realization of the actual extent of the city's support. They aggregated \$42,255,968.12, or 70.39% of the total receipts of \$60,028,272.45 of the nine pension funds from their establishment up to and including 1914.
- 3. "Unlimited" funds will impose intolerable burden upon city: Four funds are backed by the appropriating powers of the city. The excess of maturing pension claims of these funds over their regular income, derived mostly from indirect city contributions, is covered through direct taxation. Since 1904, when this practice began, up to and including the year 1914, a total of \$7,845,448.58 was obtained by the funds in question through direct taxation. This amount is but a fraction of the appropriations which will be required in the future. The two largest funds, namely, those of the police and fire departments, which up to the present have developed an annual pension charge of 16.2% and 14.1% of the respective annual expenditures of those departments for salaries, will steadily increase their demands until they will require an annual income of about 35% of the police payroll, and about 45% of the firemen's payroll, to enable them to satisfy current pension payments. The bulk of these demands will fall upon the taxpayer in the form of direct taxation. The consequent burden will become unbearable long before the ultimate development of the funds is reached.
- 4. "Limited" funds will be eventually exhausted: Five of the city's pension funds are limited in their incomes to receipts from definite sources fixed by statute. The usual experience of such funds is that, given sufficient

time, they develop pension claims in excess of their receipts. After dissipating whatever small reserves have been accumulated during the earlier years of development, the funds become bankrupt and unable to take care of new retirements.

The teachers' retirement fund is now in such a position. The health department pension fund is within a few years of disaster, having been forced to encroach in 1915, for the first time since its establishment, on its meagre accumulations of prior years. The other three "limited" funds of more recent origin, though having relatively larger (resources, will inevitably find themselves in the same predicament which now confronts the teachers' retirement fund.

From viewpoint of administration

- 1. Lack of uniform policy for entire municipal service: The lack of a uniform application of retirement provisions to all employees of the city is due not only to the discriminating character of the retirement laws, but also to their administration by as many independent retiring authorities as there are separate pension plans. The possibility of uniform interpretation of such retirement provisions as are identical under two or more separate plans is made difficult, if not impossible.
- 2. Lack of security due to frequent changes in administration: The frequent changes in departmental administration, considered in conjunction with the wide latitude of executive discretion in the application of retirement provisions, prevent any continuity of policy. Especially vicious in principle is the right of an administration to revoke, increase and decrease certain classes of pensions, mainly those of dependents of employees, granted by a preceding retiring authority because such revision is based on discretion and not on fixed rules defined by law. Even though this right is not extensively exercised, the mere possibility of arbitrary interference with existing benefits nullifies the main advantage of a retirement provision, namely, the security of its protection.
- 3. Lack of proper record system a serious handicap to scientific fund management: The failure of the city's pension plans to include legal provision for their financial soundness is responsible for the lack of an adequate system for the recording of data of vital importance in the calculation of fund requirements. The present actuarial valuation of the assets and liabilities of the nine funds by this Commission has been greatly delayed, and involved considerable expense, due to lack of necessary information in the wholly inadequate pension records kept. An elaborate and costly census of the municipal service had to be taken to obtain possession of basic facts which, under proper fund management, should have been not only a part of departmental records but available in digested form. The actuarial staff of the commission had to construct the necessary tables of mortality and service experience, notwithstanding the fact that the city has been operating

¹ Not backed by the power to charge deficiency to taxes.

a retirement system since the year 1857, and that without such tables it is impossible to make estimates of the cost of pension provisions. Much valuable statistical experience has been wasted by being left unrecorded in the past.

Principles to be Considered in Reorganization Plan

System must be rebuilt on new foundation

The shortcomings of New York's present pension policy are so serious as to render its continuation not only undesirable, but decidedly detrimental to the best interests of both the city and its employees. The long existence of the system without collapse under the weight of its own absurdities is due to the lack of general knowledge of the details of its operation and to the oblique methods of financing, by which its cost in the past has been hidden.

To attempt to reconcile the illogical features of the present pension plans would be like "patching old garments with new cloth." The fundamentals of a sound pension policy must be determined, and an entirely new system developed. Only if constructed in this manner may a new measure be expected to accomplish its main objects, namely, the security of the protection contemplated, and the progressive betterment of the service.

In the following outline is presented a summary of fundamental questions involved in framing a sound and equitable pension plan.

Compensation for accidents in performance of duty

- 1. Shall the city assume full responsibility for support in case of accidents to employees in the performance of duty?
- 2. Shall benefits for injury and death incurred in the performance of duty apply to all branches of the service or only to policemen, firemen, street cleaners and health department employees, as at present?

This class of benefit provision does not enter into the general pension problem. Standards of benefits accruing to the disabled employee and to his widow and children in case of his death are embodied in the Workmen's Compensation Act of the State of New York, and may be used as a basis in determining the details of similar provisions for city employees.

Sound retirement system regarded as essential prerequisite of efficient service

In large organizations, public and private, a system of retirement allowances is now generally regarded as an essential prerequisite to an efficient personnel. The recognition of its value as an important branch of employment plans is demonstrated by the rapid development of pension schemes, especially in the last decade. The fundamental objectives of a sound measure are the advantages gained by:

- 1. Facilitating the discontinuance of the services of those who can not perform satisfactorily the duties of their positions because of superannuation or other forms of disability.
 - 2. Clearing the lanes of promotion for the young and ambitious.
- 3. Securing adequate protection for the employee against the major risks of life, such as want in old age, disability, death, etc., which cannot be obtained by the individual through saving or commercial insurance at rates as low as a pension plan makes possible.
- 4. Promoting the good will of employees and inducing them to put forth their best efforts.
 - 5. Eliminating appeals for charity and favoritism.
- 6. Enabling the government to compete with other public and private employers having pension systems in securing and keeping high grade men and women in public service.

By many it is claimed that the city's interest in a sound retirement system is not restricted to its concern for the efficient conduct of public business and the welfare of its personnel. It is argued that its responsibilities are far broader and require that it set a standard for other employers, and thereby extend the mutual advantages of old age and disability provisions to a constantly larger number of wage earners of the community.

Financial support of pension plan a vital question

The principal difficulty in the establishment of a retirement system after the advisability of its institution has been recognized, is a satisfactory agreement on the source or sources of its support. The question is of vital importance. The widest divergence of views exists and a great number of theories are advanced for its solution.

The extremes in the methods advocated call for the payment of the entire cost of a retirement system by either the employer or the employed. The reasoning used in support of either method is plausible. The test of any theory, however, is in its practical application. The fallacies of abstract theories become apparent through tangible defects brought out by their practical operation, and a gradual change from the theoretically perfect to the practically workable method takes place.

The commission has made a broad review of existing pension systems in operation both in the United States and abroad, on which it was able to secure information. This inquiry has brought out the fact that the development of pension measures as a result of an experience of over a hundred years is in the direction of equal division of cost between the employer and the employed, and that this tendency applies equally to systems for public employees and for industrial workers.

¹ The Bureau of Municipal Research cooperated with the commission in securing and analysing data relating to the operation of foreign pension systems.

Advantages which may be derived from division of cost

The theory advanced for equal division of cost is based on the recognition of mutual responsibility on the part of the employer and the employed for existing unsatisfactory social and economic conditions under which the average wage-earner fails or is debarred from adequately protecting himself and his family against the emergencies of life. Another version of the same theory is that the operation of a sound pension plan is of as much material benefit to the employer as it is to the employee.

It is claimed that the following practical advantages result from the operation of a system which by a middle course of joint contribution reconciles extreme viewpoints embodied in the "free" and "wholly contributory" systems:

- 1. Adequacy of benefits: Adequate benefits can only be provided when financial support of a plan is derived from two sources instead of one. The practical need for two sources of income is self-evident when a pension plan is established or reorganized with full realization of the cost of assumed obligations.
- 2. Security of benefits: A system supported by the contributions of two parties to the contract has a better chance for permanency and security than a system the continuation of which depends on the free will of those who bear the entire cost. Representation of employer and employee in the management of the system tends to safeguard its equitable operation.
- 3. Promotion of good will of employees: The good will of the employee is an important advantage, which is gained by the principle of coöperation on which the system is based. The favorable effect of coöperation on the morale of the service is important.

In a "share-and-share-alike" system the contributions of an employee may be returned in case of death, resignation or dismissal. The advantages to be derived from such refund provisions are as follows:

- 1. Protection to the dependents of a deceased employee: The theory and justification of tontine features in a retirement measure do not appeal to the dependents of a deceased employee. If a return of an employee's contribution is made, the lump sum benefit is of special value to an employee's family in the heavy expense of readjustment to new conditions.
- 2. Inducement to remain in service without arbitrary restriction of an employee's independence. The disadvantage of the wholly contributory system in tempting the employee to leave in order to withdraw his accumulated salary deductions is offset in the "share-and-share-alike" system by the fact that in doing so he forfeits an equal amount of the employer's contributions, which are available to him only if he remains in the service long enough to be pensioned.
- 3. Discharge of the inefficient is facilitated: The advantage gained by the return of the employee's contributions in case of dismissal entails less expense to the retirement system than under the wholly contributory system.

In "free" pension systems where dismissal means complete loss of pension rights, the discharge of inefficient employees before they have become eligible to retirement is made difficult. The demoralizing influence of this condition on the personnel is an important consideration.

Decision necessary as to benefits

In formulating a new plan, cognizance must be taken of the heavy cost of planning any fund for the city's present great body of employees on a permanently sound basis. The necessity for compulsory application of its provisions must also be considered as it has been demonstrated by actual experience that voluntary plans are ineffective. Finally, decision must be made as to the advisability of inclusion in the plan of all necessary features by which existing disadvantageous conditions in the service may be remedied. Chiefly difficult will be the determination of effective benefits within the limits of feasible cost.

Equality in application of principles to entire service

If it is decided that the city should assume in full the responsibility for support of those who suffer injury in the performance of hazardous duty, there seems no logical reason for the extension of special privileges to any departmental subdivision of the service. The question of the advisability of variations in retirement conditions and benefits must then be considered in an entirely new light, and new lines of demarcation drawn in accordance with special conditions, such as stability of service, strain of work, differences in rates of mortality, and other considerations peculiar to various occupational groups of the city's employees.

Decision as to scope of retirement system

Before benefit provisions may be considered in detail it is necessary to decide on the general scope of the retirement system. The following groups of provisions may be considered advisable to include in the plan and are suggested as a basis for discussion:

1. Superannuation retirement: Retirement at an age at which the average employee may be considered as superannuated for the efficient performance of duty. This age would necessarily vary in accordance with the occupational group to which he belonged. It would, for instance, be advisable to retire a policeman or a fireman at an earlier age than a clerk or a teacher. In order to establish an equitable relation between the value of an employee's services and his retirement allowance, and to furnish him with an incentive to continue in his position as long as he is able, the amount of pension could be increased with length of service. A uniform proportion of his average yearly compensation for the last ten years for each year of completed service may be

recommended as an equitable basis for determining the amount of pension to be granted.

- 2. Disability retirement: A minimum service of 10 years is generally recognized as a proper limitation for eligibility to this class of benefits. The amount of pension could be determined on the same basis as in the case of superannuation, but at a lower proportion of the average compensation, so as to establish a safeguard against the improper use of disability provisions for early retirement. Periodical physical examinations and effective rules for the return to active duty of disability pensioners who have recovered their health are important additional safeguards which must be considered.
- 3. Return of contributions: The experience of the majority of pension funds of sufficiently long operation points to the advisability of refunding contributions to employees who leave the service before becoming eligible to pension.

Additional protection can be offered to employees at cost

As a result of a careful study of the exhaustive information obtained by the commission in the valuation of the existing pension funds of the city, there has been obtained an exceptionally reliable fact basis for offering employees protection at cost, in addition to the provisions to be included in the general compulsory retirement plan.

Of special value would be pensions to widows and orphans to supplement the lump sums accruing to the dependents of deceased employees through the return of their contributions with interest. Additional annuities and lump sum benefits could also be offered to the employee at cost, thereby placing within reach desirable terms of protection which under present conditions are either not obtainable or, if obtainable, beyond his means.

Administration and management of retirement system

An important prerequisite of a sound retirement system is a clear definition in the law itself of all important details so as to prevent the present wide latitude of administrative discretion in the interpretation of its provisions. In addition, a satisfactory decision is required as to the form and personnel of the administration and management of the system in order to guarantee its equitable and businesslike operation. Such a decision involves:

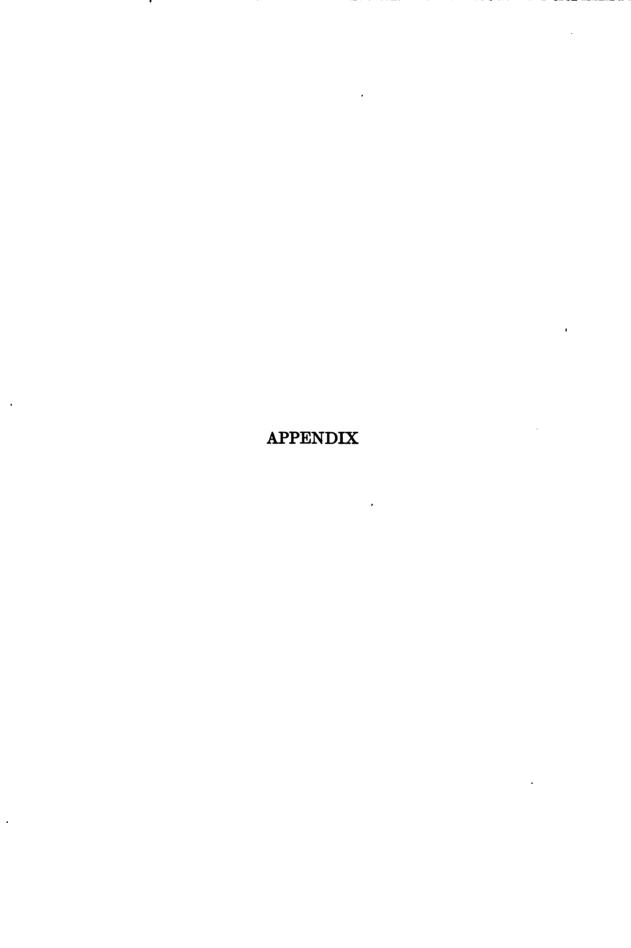
- 1. Freedom from considerations of departmental expediency in interpretation of the provisions of the law.
- 2. Uniform principle in application of retirement provisions to all employees of the municipal service.
- 3. Continuity of a retirement policy beyond the usual short term of administrative tenure.

- 4. Full responsibility for the satisfactory effect of the system, which involves the introduction of necessary amendments as soon as defects in the original law have become apparent from practical application.
- 5. Judicious investment of funds for the accumulation of adequate reserves.
 - 6. Economy in management.
- 7. Continuous actuarial study of the various elements which affect the sufficiency of contributions to insure the payment of benefits. This involves the installation of an adequate and scientific record system by which the necessary vital and other statistics may be accumulated and studied.
- 8. Continuous study of the practical effect of the system on the service and the study of current development of the pension problem in this country and abroad for the purpose of improvement of the system by revision on the basis of sound precedents.
- 9. Continuous study of the disability phases of the system with a view to perfecting legal definitions and improving the rules for initial and subsequent examinations of disability pensioners.

It is believed that all of the above objects may best be secured by a centralized administration of the system. The first mentioned five considerations make it desirable that the interpretation of the law be entrusted to a central pension board composed in part of members who are responsible for the general financial and administrative policy of the city administration. If the system includes an extensive participation in the cost by the employees they should be adequately represented in the membership of the board.

The board should of course be equipped with a competent staff adequate to maintain suitable actuarial records and to provide the service necessary to the administration of a retirement plan affecting 80,000 or more employees and involving outlays of millions of dollars a year.





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ACTIVE FORCE

December 31, 1914

COMPENSATION BY

GRADE AND AVERAGE SALARY

Tables 1 to 9

SUMMARY

	Number in Active Service	Average Annual Salary	Total Annual Salary
Gardel Daniel and Daniel Brown In 1			
Special Departmental Pension Funds 1	10 700	6 1 405 04	617.047.010.00
Police Pension Fund	10,708	\$1,405.04	\$15,045,210.00
Fire Department Relief Fund	5,004	1,503.78	7,524,900.00
Teachers' Retirement Fund	21,317	1,420.66	30,284,217.00
Health Department Pension Fund	1,256	1,040.18	1,306,464.00
College of the City of New York Retirement			
Fund	223	2,275.78	507,500.00
Department of Street Cleaning Relief and			
Pension Fund	5,474	835.35	4,572,686.50
Supreme Court, First Department, Retire-			
ment Fund	295	2,317 . 46	683,650.00
Supreme Court, Second Department, Retire-			
ment Fund	177	2,249 . 44	398,151.23
Total—Special Departmental Pension			
Funds	44,454	\$1,356 .97	\$60,322,778.73
General, City of New York employees ("Grady") Retirement Fund *			
Mechanics.	6,064	\$1,494.01	\$9,059,650.00
Laborers, Men	10,841	779.43	8,449,750.00
Laborers, Women	1,174	380.69	446,930.00
Clerks, Men	9,745	1,332.62	12,986,380.00
Clerks, Women	2,532	866.74	2,194,590.00
Exempt Employees	2,500	1,796.33	4,490,830.00
Total—"Grady Law" Retirement Fund.	32,856	\$1,145.24	\$37,628,130.00
Grand Total—All Funds	77,310	\$1,266.99	\$ 97,950,908.73

¹ The figures for the special pension funds apply to the active force as of December 31, 1914, with the exception of the teachers' retirement fund indicating the active teaching force as of May 31, 1915.

¹ Employees covered by the provisions of this fund do not include appointive and elective officers, and temporary employees whose chances for eventual retirement are remote and improbable. The figures show the status of the force on June 30, 1914.

. TABLE 1

POLICE PENSION FUND

Members of the Uniformed Force Covered by the Provisions of the Fund as of
December 31, 1914

Rank	Number in Service	Annual Salary	Total Annual Salary
Inspector	17	\$3,500.00	\$59,500.00
Captain	99	2,750.00	272,250.00
Lieutenant	564	2,250.00	1,269,000.00
Sergeant	671	1,750.00	1,174,250.00
Patrolman, 1st Grade	6,652	1,400.00	9,312,800.00
Patrolman, 2d Grade	139	1,350.00	187,650.00
Patrolman, 3rd Grade	203	1,250.00	253,750.00
Patrolman, 4th Grade	521	1,150.00	599,150.00
Patrolman, 5th, 6th, 7th Grades	1,739	1,000.00	1,739,000.00
Matron	68	1,000.00	68,000.00
Superintendent of Telegraph	1	4,000.00	4,000.00
Assistant Superintendent of Telegraph	1	3,000.00	3,000.00
Chief Lineman	1	1,752.00	1,752.00
Lineman	41	4.80 2	7,008.00
Boiler Inspector	2	1,300.00	2,600.00
Surgeon	25	3,500.00	87,500.00
Bookkeeper	1	4,000.00	4,000.00
Total	10,708		\$15,045,210.00

N	umber		Total	
	in	Annual	Annual	
8	ervice	Salary	Salary	_
	2	\$4,000.00	\$8,000.00	-
	42	3,500.00	147,000.00	
	1	3,000.00	3,000.00	
	99	2,750.00	272,250.00	
	564	2,250.00	1,269,000.00	
	1	1,752.00	1,752.00	
	41	4.80 *	7,008.00	
	671	1,750.00	1,174,250.00	
	6,652	1,400.00	9,312,800.00	
	139	1,350.00	187,650.00	
	2	1,300.00	2,600.00	
	203	1,250.00	253,750.00	
	521	1,150.00	599,150.00	
	1,807	1,000.00	1,807,000.00	
Total 1	0,708		\$15,045,210.00	

Average Salary......\$1,405.04

¹ Based on 365 days.

² Per day.

TABLE 2
FIRE DEPARTMENT RELIEF FUND

Members of the Uniformed Force Covered by the Provisions of the Fund as of December 31, 1914

Rank	Number in Service	Annual Salary	Total Annual Salary
Chief of Department	1	\$10,000.00	\$10,000.00
Deputy Chief in Charge of Brooklyn and			-
Queens	1	7,500.00	7,500.00
Deputy Chief	14	4,200.00	58,800.00
Chief of Construction	1	3,300.00	3,300.00
Chief of Battalion	46	3,300.00	151,800.00
Captain	296	2,500.00	740,000.00
Lieutenant	412	2,100.00	865,200.00
Pilot	19	1,500.00	28,500.00
Engineer of Steamer	494	1,600.00	790,400.00
Marine Engineer	6	1,600.00	9,600.00
Fireman, 1st Grade	2,719	1,400.00	3,806,600.00
Fireman, 2nd Grade	, ,	1,200.00	129,600.00
Fireman, 3rd Grade		1,000.00	692,000.00
Fireman, 4th Grade		1,000.00	172,000.00
Fireman, on Probation		1,000.00	8,000.00
Chief Medical Officer		4,200.00	4,200.00
Medical Officer	1	3,300.00	33,000.00
Fire Marshal	1	3,000.00	6,000.00
Veterinarian	2	4,200.00	8,400.00
Total	5,004		\$7,524,900.00

	-	1	
	Number	1 1	Total
	in	Annual	Annual
	Service	Salary	Salary
•	1	\$10,000.00	\$10,000.00
	1	7,500.00	7,500.00
	17	4,200.00	71,400.00
	57	3,300.00	188,100.00
	2	3,000.00	6,000.00
	296	2,500.00	740,000.00
	412	2,100.00	865,200.00
	500	1,600.00	800,000.00
	19	1,500.00	28,500.00
	2,719	1,400.00	3,806,600.00
	108	1,200.00	129,600.00
	872	1,000.00	872,000.00
Total	5,004		\$7,524,900.00

TABLE 3

TEACHERS' RETIREMENT FUND

Employees Covered by the Provisions of the Fund as of May 31, 1915 1

Title	Men	Women	Total	Total Annual Salary Charge	Average Annual Salary Charge
Superintendent	33	2	35	\$192,250.00	\$5,492.86
Board of Examiners	4		4	24,000.00	6,000.00
Supervisor and Director, Asst.				1	
Supervisor and Director, In-					1
spector and Asst. Inspector,					
Special Teacher	189	420	609	931,255.00	1,529.15
President of Hunter College	1		1	10,000.00	10,000.00
Principal of Training School	2	1	3	15,000.00	5,000.00
Principal of High School	23		23	110,500.00	4,804.35
Principal of Vocational (Trade)					
School	2	1	3	12,250.00	4,083.33
Principal of Parental School	1		1	3,000.00	3,000.00
Principal of Elementary School	229	244	473	1,527,960.00	3,230.36
Principal in Charities Dept		1	1	3,500.00	3,500.00
Asst. to Principal, Elementary					1
School	12	453	465	1,115,250.00	2,398.39
Teacher in Hunter College	12	163	175	446,372.00	2,550.70
Teacher in Training School	23	89	112	279,030.00	2,491.34
Teacher in High School	1,028	1,156	2,184	4,766,145.00	2,182.30
Teacher in Vocational (Trade)					
School	20	12	32	59,675.00	1,864.84
Teacher (Grade) in Elementary					
School	1,127	15,137	16,264	19,807,750.00	1,217.89
Kindergarten Teacher, Elem-					
entary School		920	920	967,140.00	1,051.24
Teacher, Dept. of Charities		5	5	7,440.00	1,488.00
Teacher, Dept. of Correction	7	•••••	7	5,700.00	814.29
Total	2,713	18,604	21,317	\$30,284,217.00	\$1,420.66

¹ Compiled from the records of the suditor of the board of education.

TABLE 4

HEALTH DEPARTMENT PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salar
Secretary	1	\$5,000.00	\$5,000.0
Director	8	5,000.00	15,000.0
Director Bureau Public Health Education	1	5,000.00	5,000.0
Director Bureau of Child Hygiene	1	5,000.00	5,000.0
Director General Bacteriological Laboratory.	1	5,000.00	5,000.0
Asst. Director Genl. Bacteriological Laboratory	1	3,000.00	3,000.0
Asst. Director Genl. Bacteriological Laboratory	2	2,100.00	4,200.0
Asst. Director Genl. Bacteriological Laboratory	2	1.800.00	3,600.0
Sanitary Superintendent	1 1	5,000.00	5,000.0
Assistant Sanitary Superintendent	3	3,500.00	10,500.0
Bacteriological Diagnostician	2	1,350.00	2,700.0
Bacteriological Diagnostician	ī	1,200.00	1,200.0
Bacteriological Diagnostician	ī	1,050.00	1,050.0
Bacteriologist	3	1,800.00	5,400.0
Bacteriologist	7	1,500.00	10,500.0
Bacteriologist	5	1,200.00	6,000.0
Registrar of Records	ı	5,000.00	5,000.0
Assistant Registrar of Records	5	3,000.00	15,000.0
Auditor	1 1	3,000.00	3,000.0
	i		
Clerk	4	3,000.00	3,000.0
Zlerk		2,550.00	10,200.0
Clerk	1	2,400.00	2,400.0
Clerk	2	2,100.00	4,200.0
Clerk	8	1,800.00	14,400.0
Clerk	14	1,500.00	21,000.0
Clerk	23	1,200.00	27,600.0
Clerk	4	1,050.00	4,200.0
Clerk	33	900.00	29,700.0
Clerk	10	750.00	7,500.0
Clerk	11	600.00	6,600.0
Clerk	8	540.00	4,320.0
Clerk	27	480.00	12,960.0
Clerk	13	300.00	3,900.0
aw Clerk	1	2,400 .00	2,400.0
Medical Clerk	3	1,800.00	5,400.0
Medical Clerk	1	1,200.00	1,200.0
Cabulator	1	1,800.00	1,800.0
Bookkeeper	5	1,200.00	6,000.00
Hospital Clerk	3	1,200.00	3,600.00
Iospital Clerk	2	900.00	1,800.00
Hospital Clerk	8	780.00	2,340.0
Iospital Clerk	2	750.00	1,500.0
Hospital Clerk	7	720.00	5,040.00
Hospital Clerk	2	600.00	1,200.0

TABLE 4 (Continued)

HEALTH DEPARTMENT PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salar
Inspector of Foods	3	\$1,800.00	\$5.4 00.0
Inspector of Foods		1,500.00	4,500.0
Inspector of Foods		1,350.00	8,100.0
Inspector of Foods	60	1,200.00	72,000.0
Sanitary Inspector		2,550.00	2,550.00
Sanitary Inspector	2	1,800.00	3,600.00
Sanitary Inspector	10	1,500.00	15,000.0
Sanitary Inspector		1,200.00	80,400.0
Sanitary Inspector	1 - 1	750.00	750.0
Medical Inspector	lil	3,000.00	3.000.0
Medical Inspector		2,550.00	15,300.0
Medical Inspector	1	1,950.00	1,950.0
Medical Inspector		1,800.00	, <i>,</i>
Medical Inspector			19,800.0
Medical Inspector		1,500.00	88,500.0
		1,200.00	158,400.0
Medical Inspector, Boro. Chief		1,800.00	1,800.0
Physician	2	1,800.00	3,600.0
Hospital Physician	8	1,200.00	3,600 0
Attending Physician		600.00	6,600.0
Assistant Attending Physician		300.00	300.0
Laboratory Assistant		1,050.00	2,100.0
Laboratory Assistant		900.00	10,800.0
Laboratory Assistant		75 0. 00	11,250.0
Laboratory Assistant	7	600.00	4,200.0
Pharmacist	1 1	1,200.00	1,200.0
Chemist	1	2,100.00	2,100.0
Chemist	2	1,800.00	3,600.0
Chemist		1,500.00	4,500.0
Dentist	1 1	1,500.00	1,500.0
Dentist	4	1,200.00	4,800.0
Disinfector		1,050.00	7,350.0
Disinfector	25	900.00	22,500.0
Disinfector	1 1	750.00	750.0
Matron		900.00	2,700.0
Supervising Nurse	8	1,050.00	3,150.0
Social Nurse	1 1	900.00	900.0
Nurse	4	1,200.00	4.800.0
Nurse	1	1,150.00	16,100.0
Nurse	131	900.00	117,900.0
Nurse		720.00	8,640.0
Nurse	40	600.00	24,000.0
Nurse		540.00	, ,
Nurses' Assistants	3	480.00	540.0
Orderly	1 - 1	720.00	1,440.0 4,320.0

TABLE 4 (Continued)

HEALTH DEPARTMENT PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
Orderly	. 8	\$600.00	\$4,800 .00
Orderly	. 1	500.00	500.00
Orderly		480.00	960.00
Orderly	1	360.00	1,440.00
Orderly		300.00	300.00
Orderly		240.00	480.00
Hospital Helper		720.00	720.00
Hospital Helper	1 1	600.00	600.00
Veterinarian	- 1	1,800.00	1,800.00
Veterinarian		1,500.00	3,000.00
Veterinarian		1,200.00	9,600.00
Stenographer and Typewriter		1,200.00	1,200.00
Stenographer and Typewriter		1,050.00	1,050.00
Stenographer and Typewriter		900.00	5,400.00
Stenographer and Typewriter		750.00	3,000.00
Stenographer and Typewriter		600.00	600.00
Typewriting Copyist		900.00	1,800.00
Typewriting Copyist		750.00	6,750.00
Telephone Operator	1 1	900.00	6,300.00
Captain, Steamboat and Launches		1,630.00	1,630.00
Captain, Steamboat and Launches		1,200.00	2,400.00
Boatman	1 1	720.00	1,440.00
Boatman		600.00	600.00
Automobile Engineer	1 1	1,350.00	1,350.00
Automobile Engineer		1,200.00	7,200.00
Automobile Engineer		900.00	7,200.00
Engineer		4.50 ¹ 4.50 ¹	,
Marine Engineer		4.50° 3.00°	-,
Fireman	1	3.00 ⁻ 3.00 ¹	
Marine Fireman			2,190.00 2,400.00
Bookbinder		1,200.00 750.00	750.00
Bookbinder Seamstress	1 1	720.00	720.00
Butcher	1 - 1	936.00	936.00
Carpenter	1 - 1	720.00	1,440.00
Carpenter	1 - 1	600.00	600.00
	- 1	5.00°	
CarpenterElectrician		4.50°	_,
Elevator Attendant		900.00	900.00
Gardener	1	900.00	900.00

¹ This is the rate per day and is based on 365 days.

² This is the rate per day and is based on 278 days.

This is the rate per day and is based on 313 days.

TABLE 4 (Continued)

HEALTH DEPARTMENT PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
Gardener	1	\$720.00	\$720.00
Driver	2	840.00	1,680.00
Driver	2	780.00	1,560.00
Driver	22	720.00	15,840.00
Domestic	1	600.00	600.00
Domestic	2	360.00	720.00
Domestic	8	300.00	2,400.00
Domestic	11	240.00	2,640.00
Domestic	3	216.00	648.00
Janitor	1	750.00	750.00
Messenger	1	1,050.00	1.050.00
Watchman	2	600.00	1,200.00
Stableman	5	720.00	3,600.00
Stableman	1	600.00	600.00
Foreman of Laborers	1	1,500.00	1.500.00
Foreman of Laborers	2	1,200.00	2,400.00
Laborer	1	1.050.00	1,050.00
Laborer	10	900.00	9,000.00
Laborer	9	780.00	7.020.00
Laborer	2	732.00	1,464.00
Laborer	16	720.00	11,520.00
Laborer	3	660.00	1,980.00
Laborer	57	600.00	34,200.00
Helper	3	720.00	2,160.00
Helper	2	600.00	1,200.00
Helper	5	480.00	2,400.00
Helper	2	420.00	840.00
Helper	- 6	360.00	2,160.00
Helper	iii	240.00	240.00
Cleaner	32	360.00	11,520.00
Total	1,256		\$1,306,464.00

TABLE 4 (Continued)

No. in	Annual Salary	Total Annual Salary	No. in in Service	Annual Salary	Total Annual Salar
III Del vice		Amuai Salai y	III Service		Amidai balai,
9	\$5,000.00	\$45,000.00	44	\$750.00	\$33,000.00
3	3,500.00	10,500.00	2	732.00	1,464.00
9	3,000.00	27,000.00	78	72 0.00	56,160.00
11	2,550.00	28,050.00	3	660.00	1,980.00
2	2,400.00	4,800.00	146	600.00	87,600.00
5	2,100.00	10,500.00	9	540.00	4,860.00
1	1,950.00	1,950.00	1 1	500 .00	500.00
39	1,800.00	70,200.00	37	480.00	17,760.00
1	1,630.00	1,630.00	2	420.00	840.00
100	1,500.00	150,000.00	44	360.00	15,840.00
9	1,350.00	12,150.00	23	300.00	6,900.00
330	1,200.00	396,000.00	14	240.00	3,360.00
14	1,150.00	16,100.00	3	216.00	648.00
20	1,050.00	21,000.00	1 1	5.00 ¹	1,390.00
1	936.00	936.00	13	4.50	21,352.50
242	900.00	217,800.00	23	3.00 2	25,185.00
2	840.00	1,680.00	1 1	4.50	1,408.50
14	780.00	10,920.00			
Total		1	1,256		\$1,306,464.00
Average	Salary] -,		\$1,040.18

¹ This is the rate per day and is based on 278 days.

² This is the rate per day and is based on 365 days.

³ This is the rate per day and is based on 313 days.

TABLE 5

COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
President	1	\$8,250.00	\$8,250.00
Professor and Librarian	1	5,500.00	5,500.00
Professor	13	5,000.00	65,000.00
Professor	2	4,750.00	9,500.00
Associate Professor	3	4,000.00	12,000.00
Associate Professor	2	3,750.00	7,500.00
Associate Professor	5	3,500.00	17,500.00
Associate Professor	ĺ	3,350.00	3,350.00
Associate Professor	l ī	3,000.00	3,000.00
Associate Professor	3	2,750.00	8,250.00
Assistant Professor	1	3,250.00	3,250.00
Assistant Professor	17	2,750.00	46,750.00
Assistant Professor	2	•	
Assistant Professor	7	2,600.00	5,200.00
		2,500.00	17,500.00
Assistant Professor	3	2,400.00	7,200.00
Assistant Professor	3	2,300.00	6,900.00
Assistant Professor	1	2,200.00	2,200.00
Assistant Professor	1	2,100.00	2,100.00
Assistant Professor	1	2,000.00	2,000.00
Instructor	1 1	2,800.00	2,800.00
Instructor	6	2,750.00	16,500.00
Instructor	4	2,700.00	10,800.00
Instructor	3	2,500.00	7,500.00
Instructor	7	2,40 0.00	16,800.00
Instructor	9	2,30 0.00	20,700.00
Instructor	17	2,200 .00	37,400.00
Instructor	10	2,100.00	21,000.00
Instructor	3	2,000.00	6,000.00
Instructor	4	1,900.00	7,600.00
Instructor	21	1,700.00	35,700.00
Special Instructor	1	1,000.00	1,000.00
Tutor	15	1,700.00	25,500.00
Tutor	9	1,650.00	14,850.00
Tutor	i	1,600.00	1,600.00
Tutor	7	1,550.00	10,850.00
Tutor	1	1,500.00	1,500.00
Tutor	7	1,250.00	8,750.00
Tutor	4	1,100.00	4,400.00
Tutor	16	1,000.00	16,000.00
Assistant Tutor	1	1,500.00	1,500.00
Assistant Tutor	1 1	1,100.00	1,100.00
Assistant Tutor	3	900.00	2,700.00
Assistant Tutor	1	600.00	600.00
Assistant Tutor	1 1		
Assistant Tutor	2	500.00 450.00	500.00 900.00
MAXIMUMAU & WUVE		\$00.00	800.00
Total	223		\$507,500.00

TABLE 5 (Continued)

Number in Service	Annual Salary	Total Annual Salary	Number in Service	Annual Salary	Total Annual Salary
1 13 2 3 2 5 1 1 1 26 4 2	\$8,250.00 5,500.00 5,000.00 4,750.00 4,000.00 3,750.00 3,500.00 3,250.00 3,000.00 2,800.00 2,750.00 2,600.00 2,500.00	\$8,250.00 5,500.00 65,000.00 9,500.00 12,000.00 7,500.00 17,500.00 3,350.00 3,250.00 3,000.00 2,800.00 71,500.00 10,800.00 5,200.00	18 11 4 36 9 1 7 2 7 5 17 3	\$2,200.00 2,100.00 2,000.00 1,900.00 1,700.00 1,650.00 1,550.00 1,500.00 1,250.00 1,100.00 1,000.00 900.00 600.00	\$39,600.00 23,100.00 8,000.00 7,600.00 61,200.00 14,850.00 1,600.00 3,000.00 8,750.00 5,500.00 17,000.00 2,700.00 600.00
10 12	2,400.00 2,300.00	24,000.00 27,600.00	2	450.00	900.00
Total Average	Salary] 	223		\$507,500.00 \$2,275.78

TABLE 6
City of New York Employees' Retirement Fund

Employees Covered by Provisions of "Grady Law" (Exclusive of Elective and Appointive Officers and temporary employees), as of June 30, $1914^{\,1}$

Group of Employees	Number	Total Annual Salary	Average Salary
Mechanics	6,064	\$9,059,650.00	\$1,494 .01
Men	10,841	8,449,750.00	779.43
Women	1,174	446,930.00	380.69
Clerks:	1		
Men	9,745	12,986,380.00	1,332.62
Women	2,532	2,194,590.00	866.74
Exempt Employees	2,500	4,490,830.00	1,796.33
Total	32,856	\$37,628,130.00	\$1,145.24

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 7

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914 1

Title	Number in Service	Annual Salary	Total Annual Salary
General Superintendent		\$3,000.00	\$3,000.00
Assistant General Superintendent		2,500.00	2,500.00
District Superintendent		2,100.00	56,700.00
Section Foreman	101	1,200.00	121,200.00
Stable Foreman		1,500.00	36,000.00
Assistant Stable Foreman	24	1,000.00	24,000.00
Assistant Foreman, 2nd Grade	253	900.00	227,700.00
Superintendent of Final Disposition	1	2,500.00	2,500.00
Asst. Supt. of Final Disposition	1	1,800.00	1,800.00
Dump Inspector	42	1,200.00	50,400.00
Assistant Dump Inspector	43	900.00	38,700.00
Master Mechanic	1	1,800.00	1,800.00
Foreman of Mechanics	3	1,500.00	4,500.00
Assistant Engineer ²	1	2,100.00	2,100.00
Automobile Engineman ³	. 4	1,200.00	4,800.00
Automobile Machinist	1	1,200.00	1,200.00
Transitman and Computer 2	1	1,800.00	1,800.00
Draftsman 2	1	1,050.00	1,050.00
Medical Examiner *	4	1,800.00	7,200.00
Chief Veterinarian 2	1	2,100.00	2,100.00
Veterinarian ²	6	1,500.00	9,000.00
Apothecary 2	1	1,200.00	1,200.00
Chief Clerk 2	1	3,600.00	3,600.00
Law Clerk ²	1 1	2,850.00	2,850.00
Payroll Clerk ²	1 1	3,250.00	3,250.00
Clerk ²	1	3,000.00	3,000.00
Clerk ²	1	2,700.00	2,700.00
Clerk ²	2	2,400.00	4,800.00
Clerk ³	1	2,250.00	2,250.00
Clerk ²	3	2,100.00	6,300.00
Clerk ²	2	1,950.00	3,900.00
Clerk ²	- a	1,800.00	5,400.00
Clerk ²	4	1,650.00	6,600.00
Clerk ²	4	1,500.00	6,000.00
Clerk 2.	$\bar{2}$	1,350.00	2,700.00
Clerk *	8	1,200.00	9,600.00
Clerk ²	6	1,050.00	6,300.00
Clerk *	7	900.00	6,300.00
Clerk ²	10	750.00	7,500.00
Clerk *.	6	600.00	3,600.00
Clerk 2		540.00	1,080.00
Chief Bookkeeper ²	í	3,500.00	3,500.00
Switchboard Operator 2		900.00	4,500.00
Switchboard Operator 2		720.00	3,600.00
Messenger 3		1,200.00	2,400.00
Supervisor of Juvenile League 2		1,200.00	1,200.00
		1,200.00	1,200.00
Guard 3	1 1		•
Stenographer and Typewriter ²	1 1	1,650.00	1,650.00

TABLE 7—Continued

NEW YORK DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Employees Covered by the Provisions of the Fund as of December 31, 1914 ¹

Title	Number in Service	Annual Salary	Total Annual Salary
Stenographer and Typewriter *	8	\$1,200.00	\$9,600.00
Mechanic	4	5.50 a	6,116.00
Mechanic	24	5.00*	33,360.00
Mechanic	26	4.50	32,526.00
Mechanic	37	4.003	41,144.00
Mechanic	3	3.75*	3,127.50
Sweeper	2,690	780.00	2,098,200.00
Section Station Keeper		780.00	65,520.00
Custodian of Yards	9	780.00	7,020.00
Driver	1,457	800.00	1,165,600.00
Hostler	183	800.00	146,400.00
Stableman	188	760.00	142,880.00
Boardman	35	800.00	28,000.00
Mechanics' Helper	102	3.003	85,068.00
Stoker	1	3.004	1,095.00
Total	5,474		\$4,572,686.50

Number in Service	Annual Salary	Total Annual Salary	Number in Service	Annual Salary	Total Annual Salary
1 1 2 1	\$3,600.00 3,500.00 3,250.00 3,000.00 2,850.00 2,700.00	\$3,600.00 3,500.00 3,250.00 6,000.00 2,850.00 2,700.00	7 24 308 1,675 2,783 188	\$1,050.00 1,000.00 900.00 800.00 780.00 760.00	\$7,350.00 24,000.00 277,200.00 1,340,000.00 2,170,740.00 142,880.00
2 1 32 10	2,500.00 2,400.00 2,250.00 2,100.00 1,950.00 1,800.00	5,000.00 4,800.00 2,250.00 67,200.00 3,900.00 18,000.00	10 5 6 2 4 24	750.00 720.00 600.00 540.00 5.50* 5.00*	7,500.00 3,600.00 3,600.00 1,080.00 6,116.00 33,360.00
5 37 2 169	1,650.00 1,500.00 1,350.00 1,200.00	8,250.00 55,500.00 2,700.00 202,800.00	26 37 3 102	4.50 ° 4.00 ° 3.75 ° 3.00 ° 3.00 °	32,526.00 41,144.00 3,127.50 85,068.00 1,095.00
Total			5,474		\$4 ,572,686.50

 Average Salary (Clerical Force, 108)
 \$1,337.89

 Average Salary (Uniformed Force, 5,366)
 825.14

 Average Salary (Combined, 5,474)
 835.35

¹ Compiled from the records of the department. ² Clerical force. ³ This is the rate per day and is based on 278 days. ⁴ This is the rate per day and is based on 365 days.

TABLE 8
SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Employees of the Appellate Division, Supreme Court, and County Clerk's Office, New York County, Covered by the Provisions of the Fund as of December 31, 1914 ¹

Title	Number in Service	Annual Salary	Total Annual Salary
Supreme Court, Appellate Division, First Dept.:			
Clerk	1	\$6,000.00	\$6,000.00
Librarian	1	4,000.00	4,000.00
Deputy Clerk	1	3,500.00	3,500.00
Stenographer	3	3,600.00	10,800.00
Crier	1	3,000.00	3,000.00
Assistant Clerk	3	3,000.00	9,000.00
Clerk to Justice	4	2,500.00	10,000.00
Attendant	18	1,800.00	32,400.00
Typewriter	1	1,800.00	1,800.00
Telephone Operator	1	1,200.00	1,200.00
a	34		\$81,700.00
Supreme Court, First District: Librarian	1	\$4,000.00	\$4,000.00
Special Deputy Clerk	1 6	4,000.00	24,000.00
Special Deputy Clerk	ľi	2,500.00	2,500.00
Confidential Clerk, Appellate Term	ī	4,000.00	4,000.00
Clerk to Justice	8	3,500.00	28,000.00
Stenographer	29	3,600.00	104,400.00
Interpreter	1	2,750.00	2,750.00
Interpreter	4	2,500.00	10,000.00
Special Deputy Clerk	20	2,500.00	50,000.00
Assistant Special Deputy Clerk	39	2,500.00	97,500.00
Assistant Crier	1	2,500.00	2,500.00
Assistant Confidential Clerk, Appellate	-	_,000.00	_,000.00
Term	1	2,500.00	2,500.00
Clerk to Justice	2	2,500.00	5,000.00
Assistant Special Deputy Clerk		2,000.00	2,000.004
Attendant	103	1,800.00	185,400.00
Telephone Operator	1	1,200.00	1,200.00
	219		\$525,750.00
County Clerk's Office, New York County:		60 500 00	60 700 00
Law Clerk	1 1	\$3,500.00	\$3,500.00
	1 1	3,500.00	3,500.00
Auditor	1 1	2,600.00	2,600.00
Assistant Law Clerk		2,500.00	2,500.00
Recording		2,500.00	2,500.00

¹ As shown on payrolls. ² Paid by the State of New York. ² Receives \$5,000 also, as clerk of the Court of General Sessions. ⁴ Receives \$4,000 also, as deputy clerk of the Court of General Sessions.

TABLE 8 (Continued)

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Employees of the Appellate Division, Supreme Court, and County Clerk's Office, New York
County, Covered by the Provisions of the Fund as of December 31, 1914

Title	Number in Service	Annual Salary	Total Annual Salary
Clerk of Common Pleas and Superior			
Court Records	2	\$2,500.00	\$5,000.00
Searcher	1	2,400.00	2,400.00
General Clerk	2	2,400.00	4,800.00
General Clerk	3	2,100.00	6,300.00
General Clerk	2	2,000.00	4,000.00
General Clerk	1	1,800.00	1,800.00
General Clerk	1	1,600.00	1,600.00
General Clerk	10	1,500.00	15,000.00
General Clerk	2	1,200.00	2,400.00
Recording Clerk	2	1,500.00	3,000.00
Recording Clerk	2	1,200.00	2,400.00
Certificate Clerk	1	2,000.00	2,000.00
Assistant Certificate Clerk	1	1,500.00	1,500.00
Index Clerk	3	1,500.00	4,500.00
Mechanics' Lien Clerk	1	1,300.00	1,300.00
Custodian	2	1,200.00	2,400.00
Bookbinder	1	1,200.00	1,200.00
	42	•••••	\$76,200.00
Total	295		\$683,650.00

RECAPITULATION

Number	Annual	Total	Number	Annual	Total
in Service	Salary	Annual Salary	in Service	Salary	Annual Salary
1	\$6,000.00¹	\$6,000.00	3	\$2,400.00	\$7,200.00
9	4,000.00	36, 000.00	3	2,100 .00	6,300.00
32	3,600.00	115,200.00	8	2,000 .00	6,000.00
11	3,500.00	38,500.00	1	2,000.00*	2,000.00
4	3,000.00	12,000.00	123	1,800.00	221,400.00
1	2,750.00	2,750.00	1	1,600.00	1,600.00
1	2,600.00	2,600.00	16	1,500.00	24,000.00
75	2,500.00	187,500.00	1	1,300.00	1,300.00
1	2,500.00 2	2,500.00	9	1,200.00	10,800.00
Total			295		\$683,650.00

Average Salary.....\$2,317.46

¹ Paid by the State of New York. ² Receives \$5,000 also, as clerk of the Court of General Sessions. ³ Receives \$4,000 also, as deputy clerk of the Court of General Sessions.

TABLE 9

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Employees of the Supreme Court, Second Department, Covered by the Provisions of the Fund as of December 31, 1914 1

Title	Number in Service	Annual Salary	Total Annual Salary Paid by N. Y. City
Supreme Court, Second Department:			
General Clerk	1 1	\$5,000.00	\$5,000.00
Assistant General Clerk	1 1	3,500.00	3,500.00
Clerk	1 1	4,000.00	4,000.00
Clerk	4	3,500.00	14,000.00
Clerk	11	3,000.00	33,000.00
Clerk	2	2,500.00	5,000.00
Assistant Clerk	18	2,000.00	36,000.00
Stenographer	11	3,600.00	39,600.00
Stenographer		2,500.00	5,000.00
Confidential Attendant	1	3,000.00	3,000.00
Chief Attendant	1 1	3,000.00	3,000.00
Attendant	13	2,000.00	26,000.00
Attendant	16	1,800.00	28,800.00
Attendant	16	1,500.00	24,000.00
Interpreter		2,500.00	10,000.00
Interpreter		1,500.00	3,000.00
Clerk to Justice	10	2,750.00	27,500.00
Typewriter Operator	I—————————————————————————————————————	1,500.00	1,500.00
Supreme Court, Appellate Term, Second Dept.:	115		\$271,900.00
Chief Clerk	1	\$3,500.00	\$3,500.00
Deputy Clerk	1 1	3,000.00	3,000.00
Confidential Clerk and Stenographer	1	2,500.00	2,500.00
Attendant	1	1,800.00	1,800.00
	4		\$10,800.00
Supreme Court Library in Boro. of Brooklyn:		24.000.00	4 200 20
Librarian	1	\$4,200.00	\$4,200.00
Assistant Librarian	1	2,500.00	2,500.00
Clerk	11	1,500.00	1,500.00
Samuella Carella Carella Carella	3		\$8,200.00
Supreme Court, Queens County: Special Deputy Clerk	1	\$3,600.00	\$3,600.00
• • ·		3,500.00	3,500.00
Special Deputy Clerk	3	2,500.00	7,500.00
Chief Court Attendant	1 1	1,800.00	1,800.00
Court Attendant	4	1,600.00	6,400.00
Court Attendant.	, - ,	1,500.00	6,000.00
Interpreter		2,000.00	2,000.00
Interpreter	i	1,500.00	1,500.00
interpreter	16	1,000.00	\$32,300.00
Supreme Court Library, Queens County:			1
Librarian	-	\$1,650.00	\$1,650.00
Clerk	1	480.00	480.00
	2	•••••	\$2,130.00
Supreme Court, Richmond County:	1		
Special Deputy Clerk		\$3,000.00	\$3,000.00
Special Deputy Clerk		2,500.00	2,500.00
Court Attendant		1,500.00	3,000.00
	4		\$8,500.00

TABLE 9 (Continued)

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Employees of the Supreme Court, Second Department, Covered by the Provisions of the Fund as of December 31, 1914 ¹

Title .	No. in Service	Annual Salary	Total Annual Salary	Portion of Total Annual Salary Paid by N. Y. City
Supreme Court, Second Judicial Dist.* (Excluding Kings County) Clerk to Justice	5	\$2,750.00 3,600.00 2,500.00	\$13,750.00 10,800.00 2,500.00	\$10,217.48* 9,883.104
Supreme Court, Second Department, Appellate Division	9		\$27,050.00	\$20,100.58
Deputy Clerk	1	\$5,000.00	\$5,000.00)	
Case and Consultation Clerk	1	3,500.00	3,500.00	
Attendant and Crier		1,800.00	1,800.00	l
Confidential Attendant		1,800.00	3,600.00}	\$31,059.74
Attendant		1,800.00	14,400.00	
Confidential Clerk	1	4,500.00	9,000.00	
Typewriter Operator		2,000.00	4,000.00	
Clerk to Justice	7	2,500.00	17,500.00	13,160.91
	24		\$58,800.00	\$44,220.65
Total	177			\$398,151.23

¹ Compiled from payrolls, budget of 1915 and civil lists.

² Salaries paid by the state, which are later reimbursed by the counties included, upon the basis of taxable valuation. The appropriations by the city in the budget of 1915 are used as a basis, as the state fiscal year is from October 1, 1914 to September 30, 1915, which includes December 31, 1914.

² Based upon appropriations for Queens and Richmond Counties of \$8,718.05 and \$1,499.43 respectively.

⁴Based upon appropriations for Queens and Richmond Counties of \$35,189.25 and \$6,052.24 respectively for justices and stenographers. The appropriation was made upon the basis of \$37,500.00 for justices and \$18,000.00 for stenographers for the year. As the total salary of the stenographers on December 31, 1914, was \$10,300.00, the proportionate annual salary charge against the city of New York was \$8,432.74 for Queens and \$1,450.36 for Richmond.

⁵ Based upon appropriation of \$32,508.90 for the counties of Kings, Queens and Richmond. The total appropriation of the state of \$43,226.92 included \$1,926.92 for deficiencies; the annual charge, therefore, was \$41,300.00, and the proportionate part of the same chargeable against the city of New York was \$31,059.74, distributable among counties as follows: Kings County—\$23,371.66; Queens County—\$6,559.84; Richmond County—\$1,128.24.

Based upon appropriation for Kings, Queens and Richmond Counties of \$9,903.24,
 \$2,779.61 and \$478.06 respectively.

TABLE 9-Continued

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Employees of the Supreme Court, Second Department, Covered by the Provisions of the Fund as of December 31, 1914

RECAPITULATION 1

_	Number in Service	Annual Salary	Total Annual Salary	Portion of Total Annual Salary Paid by City
	1	\$5,000.00		\$5,000.00
	1	4,200.00		4,200.00
	1	4,000.00		4,000.00
	12	3,600.00		43,200.00
	7	3,500.00		24,500.00
	15	3,000.00	 	45,000.00
	10	2,750.00		27,500.00
	14	2,500.00		35,000.00
	32	2,000.00		64,000.00
	18	1,800.00	1	32,400.00
	1	1,650.00		1,650.00
	4	1,600.00		6,400.00
	27	1,500.00	1	40,500.00
	1	480.00		480.00
_	144			\$333,830.00
	5	\$2,750.00	\$13,750.00	\$ 10,217.48
	3	3,600.00	10,800.001	0.000.10
	1	2,500.00	2,500.00	9,883 . 10
	1	5,000.00	5,000.00	
	2	4,500.00	9,000.00	
	1	3,500.00	3,500.00	31,059.74
	2	2,000.00	4,000.00	,
	11	1,800.00	19,800.00	
	7	2,500.00	17,500.00	13,160.91
_	83			\$64,321.23
 !otal	177	•••••		\$ 398,151. 23

Average Salary..... \$2,249.44

¹ The active force is summarised in two sections, only a portion of the salaries of those included in the second section being paid by the city. The figures in the final column represent the amount paid by the city, based upon the amount appropriated for the counties of Kings, Queens and Richmond.

ACTIVE FORCE

June 30, 1914

DISTRIBUTION BY

PRESENT AGE AND LENGTH OF SERVICE

Tables 10 to 18

SUMMARY:

	Active	Employees Eligible to	Retirem	ent
Pension Fund	Force June 30, 1914	Conditions of Retirement	Number	Per Cent. of Active Force
1. Police Pension Fund	10,783	25 years' service if 55 years old	304	2.82
2. Fire Department Relief Fund	5,009	20 years' service	422	8.42
3. Teachers' Retirement Fund.	20,588	3	979¹	4.76
Men	2.608	30 years' service	501	1.92
Women	17,980	30 years' service	9291	5.17
4. Health Dept. Pension Fund.	1,262		50	3.96
Men	867	20 years' service	46	5.31
Women	<i>395</i>	20 years' service	4	1.01
5. College of the City of N. Y.				
Retirement Fund	218	20 years' service	33	15.14
 City of New York Employ- ees' ("Grady"), Exclu- sive of Appointive and Elective, Retirement Fund 	32,856	30 years' service, if dis- abled ²	322*	0.98
7. Department of Street Clean- ing Relief and Pension Fund	5,426	20 years' service, if 60		
8. Supreme Court, First Dept.,	,	years old	70	1.29
Retirement Fund 9. Supreme Court, Second Dept.,	294	25 years' service	46	15.65
Retirement Fund	138	25 years' service, if dis- abled	5	3.62
Total—All Funds	76,574		2,231	2.90

¹ Excluding teachers whose 30 years' service includes "outside" teaching experience.

² Civil War Veterans may retire after 20 years' service if disabled.

 $^{^{\}circ}$ Eighty-seven veterans who have more than 20 and less than 30 years are included in this number.

TABLE 10

POLICE PENSION FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

		Length of Service								
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20		25 and Over			
20 years and less than 25 years	386	386								
25 years and less than 30 years	1,860	1,484	376							
30 years and less than 35 years	2,724	700	1,829	195						
35 years and less than 40 years	2,112	39	1,028	956	89					
40 years and less than 45 years	1,418	9	48	550	744	66	1			
45 years and less than 50 years	1,059	1	5	40	555	410	48			
50 years and less than 55 years	805	1	4	7	110	342	341			
55 years and less than 60 years	321				7	87	227			
60 years and less than 65 years	71			2	1	10	58			
65 years and less than 70 years	21				3	4	14			
70 years and less than 75 years	6	• • • •				1	5			
Total	10,783	2,620	3,290	1,750	1,509	920	694			

Average age of entrants during six-year period ending June 30, 1914.....25.9 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 11

FIRE DEPARTMENT RELIEF FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

		Length of Service							
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	1	25 and Over		
20 years and less than 25 years 25 years and less than 30 years	277 916	277 733	182						
30 years and less than 35 years		266	746	210					
35 years and less than 40 years	, ,	4	492	655	70				
40 years and less than 45 years			6	237	391	48			
45 years and less than 50 years	370		3	2	219	121	25		
50 years and less than 55 years	185	2		2	69	49	63		
55 years and less than 60 years	90				15	. 9	66		
60 years and less than 65 years	34				5		29		
65 years and less than 70 years	9						9		
70 years and less than 75 years	3					1	2		
Total	5,009	1,282	1,429	1,107	769	228	194		

Average age of entrants during six-year period ending June 30, 1914.....25.9 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 12

TRACHERS' RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MEN

		Length of Service ²									
Present Age Tots	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over			
20 yrs. and less than 25 yrs	165	161	4								
25 yrs. and less than 30 yrs	542	229	290	23	••••			••••			
30 yrs. and less than 35 yrs	529	80	203	239	7	l					
35 yrs. and less than 40 yrs	466	73	136	129	125	3					
40 yrs. and less than 45 yrs	360	33	91	108	97	30	1				
45 yrs. and less than 50 yrs	232	8	41	60	75	25	22	1			
50 yrs. and less than 55 yrs	141		6	28	50	26	24	7			
55 yrs. and less than 60 yrs	77		2	13	17	15	16	14			
60 yrs. and less than 65 yrs	68			7	21	11	13	16			
65 yrs. and less than 70 yrs	28		••••	1	7	2	6	12			
Total	2,608	584	773	608	399	112	82	50			

Average age of entrants during six-year period ending June 30, 1914..... 28.8 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Not including teaching experience outside of city of New York schools.

TABLE 12a

TEACHERS' RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service 1

WOMEN

		Length of Service 2									
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over			
17 yrs. and less than 20 yrs	16	16									
20 yrs. and less than 25 yrs	3,305	3,217	88	l							
25 yrs. and less than 30 yrs	1 '	1,408	2,519	183							
30 yrs. and less than 35 yrs	1 '	247	1,022	1,696	179	1					
35 yrs. and less than 40 yrs		178	385	671	1,261	160					
40 yrs. and less than 45 yrs	, ,	96	249	345	453	738	116	2			
45 yrs. and less than 50 yrs	, ,	17	66	215	185	217	495	104			
50 yrs. and less than 55 yrs	790	4	9	81	104	74	138	380			
55 yrs. and less than 60 yrs	414	1	1	19	37	58	34	264			
60 yrs. and less than 65 yrs	192			12	11	11	15	143			
65 yrs. and less than 70 yrs	51	1		4	4	4	5	33			
70 yrs. and less than 75 yrs	4	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •			1		3			
Total	17,980	5,185	4,339	3,226	2,234	1,264	803	929			

Average age of entrants during six-year period ending June 30, 1914..... 23.5 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Not including teaching experience outside of city of New York schools.

TABLE 13

HEALTH DEPARTMENT PENSION FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MEN

		Length of Service							
Present Age	Total	Less Than 5 Years		10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over		
15 yrs. and less than 20 yrs	15	15							
20 yrs. and less than 25 yrs	64	44	20		••••	l	••••		
25 yrs. and less than 30 yrs	70	26	26	18	• • • •		• • • •		
30 yrs. and less than 35 yrs	124	38	59	17	10				
35 yrs. and less than 40 yrs	155	41	54	31	25	4	••••		
40 yrs. and less than 45 yrs	160	24	54	42	35	5			
45 yrs. and less than 50 yrs	105	10	25	22	37	10	1		
50 yrs. and less than 55 yrs	69	6	24	19	15	5			
55 yrs. and less than 60 yrs	51	6	13	14	10	4	4		
60 yrs, and less than 65 yrs	26	ī	9	6	5	1	4		
65 yrs. and less than 70 yrs	15	1	3	4	4		3		
70 yrs. and less than 75 yrs	10		2	1	3	3	1		
75 yrs. and less than 80 yrs	1				1				
80 yrs. and less than 85 yrs	2			1			1		
Total	867	212	289	175	145	32	14		

Average age of entrants during six-year period ending June 30, 1914.....30.7 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 13a

HEALTH DEPARTMENT PENSION FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

WOMEN

		Length of Service								
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over			
Less than 20 yrs	2	2								
20 yrs. and less than 25 yrs	_	6	4		• • • • •	::::	• • • •			
25 yrs. and less than 30 yrs	45	14	29	····2	••••		• • • • •			
30 yrs. and less than 35 yrs	78	32	35	9	2	::::	• • • •			
35 yrs. and less than 40 yrs	86	40	29	16	ī	::::				
40 yrs. and less than 45 yrs	76	26	31	14	3	2	• • • •			
45 yrs. and less than 50 yrs	48	11	14	13	9	اا	1			
50 yrs. and less than 55 yrs	35	3	14	13	4		î			
55 yrs. and less than 60 yrs	11	2	4	2	3		•			
60 yrs. and less than 65 yrs	3		1	2	·	::::	••••			
65 yrs. and less than 70 yrs	1	••••			1		••••			
Total	395	136	161	71	23	2	2			

Average age of entrants during six-year period ending June 30, 1914.... ...31.9 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 14

College of the City of New York Retirement Fund

Active Force as of June 30, 1914, Classified by Age and Length of Service 1

		Length of Service							
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over		
20 years and less than 25 years	26 13 2 7 7	11 11 7 1 1 	12 20 21 10 10 1 	15 12 15 15 8 4	 1 8 4 4 2	·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ··	 3 6 2 3 4		
70 years and less than 75 years 75 years and less than 80 years	4 1	••	••		••	••	3 1		
Total	218	31	77	58	19	11	22		

Average age of entrants during six-year period ending June 30, 1914.... ... 27.7 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15

CITY OF NEW YORK EMPLOYERS' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MEN LABORERS

		Length of Service								
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over		
15 years and less than 20 years	17	17								
20 years and less than 25 years	156	151	5							
25 years and less than 30 years	716	555	160	1						
30 years and less than 35 years	1,158	612	483	62	1					
35 years and less than 40 years	1,378	599	583	162	30	4	l l			
40 years and less than 45 years	1,457	546	601	217	86	7				
45 years and less than 50 years	1,486	514	561	249	132	24	6			
50 years and less than 55 years	1,386	413	507	248	153	42	19	4		
55 years and less than 60 years	1,191	310	409	222	172	53	20	5		
60 years and less than 65 years	772	158	244	186	120	29	22	13		
65 years and less than 70 years	577	86	135	152	131	37	20	16		
70 years and less than 75 years	389	45	81	101	95	32	23	12		
75 years and less than 80 years	121	5	14	34	47	8	3	10		
80 years and less than 85 years	29	1	5	9	8	5		1		
85 years and over	8	1	••••	2	2	••••	1	2		
Total	10,841	4,013	3,788	1,645	977	241	114	63		

Average age of entrants during six-year period ending June 30, 1914..... 39.0 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15a

City of New York Employees' ("Grady") Retirement Fund

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

WOMEN LABORERS

			Length of Service							
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 to 30 In- clu- sive			
16 years and less than 20 years	98	98								
20 years and less than 25 years		106	8							
25 years and less than 30 years	84	70	12	2						
30 years and less than 35 years	83	47	28	5	3					
35 years and less than 40 years	115	70	37	5	3					
40 years and less than 45 years	166	77	55	23	8	2	1			
45 years and less than 50 years	187	69	60	29	24	3	2			
50 years and less than 55 years	151	41	48	22	31	7	2			
55 years and less than 60 years	92	13	19	14	31	7	8			
60 years and less than 65 years	51	6	10	3	16	10	6			
65 years and less than 70 years	22	3	1	3	8	2	5			
70 years and less than 75 years	6		ī	1	2	1	1			
75 years and less than 80 years	3				1	1	ī			
80 years and less than 85 years	2	1	•••	1		••				
Total	1,174	601	279	108	127	33	26 3			

Average age of entrants not developed.

 $^{^{\}rm 1}$ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Seven of these have over 30 years' service.

TABLE 15b

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MEN CLERKS

		Length of Service								
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over		
15 years and less than 20 years 20 years and less than 25 years	390 1,153	390 1,046	107							
25 years and less than 30 years 30 years and less than 35 years	1,403 1,544	1,032 813	329 590	42 121	19	1		••••		
35 years and less than 40 years 40 years and less than 45 years 45 years and less than 50 years	1,258 1,097 864	560 401 244	442 309 206	175 214 178	75 147 181	6 24 38	2 17	• • • •		
50 years and less than 55 years 55 years and less than 60 years	689 514	165 107	156 91	117 91	185 133	41 40	19 33	6 19		
60 years and less than 65 years 65 years and less than 70 years 70 years and less than 75 years	329 237 186	45 26 19	58 43 19	56 50 26	96 72 58	36 22 25	21 9 21	17 15 18		
75 years and less than 80 years 80 years and less than 85 years	68 9	3 2	3 2	9	31 5	7	8	7		
85 years and less than 90 years	9,745	4,853	2,355	1,080	1,003	241	130	83		
TOWAL	0,120	7,000	2,000	1,000	1,000	241	150			

Average age of entrants during six-year period ending June 30, 1914......30.4 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15c

CITY OF NEW YORK EMPLOYERS' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service 1

WOMEN CLERKS

				Lei	ngth of	Service		
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over
15 years and less than 20 years	17	17						
20 years and less than 25 years	247	230	17				• • • • •	••••
25 years and less than 30 years	630	508	111	11				• • • •
30 years and less than 35 years	585	353	156	68	8	• • • • •	••••	• • • •
35 years and less than 40 years	425	241	112	46	24	2	• • • • •	• • • •
40 years and less than 45 years	285	145	75	46	13	4	2	••••
45 years and less than 50 years	174	64	54	28	20	4	4	••••
50 years and less than 55 years	90	28	21	23	13	2	3	• • • •
55 years and less than 60 years	50 51	15	12	8	9	3	3	1
60 years and less than 65 years	12	10	4	2	5	°	0	1
65 years and less than 70 years	10	1	2	4	2	••••	• • • • •	•
70 years and less than 75 years	5	•		2	2		3	1
		••••	••••	4	• • • • •	1	°	• • • •
75 years and less than 80 years	1		••••		••••	1	••••	
Total	2,532	1,602	564	238	94	16	15	3

Average age of entrants not developed.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15d

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

MECHANICS

		Length of Service								
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over		
15 years and less than 20 years	1	1								
20 years and less than 25 years	286	284	2							
25 years and less than 30 years	702	584	113	5						
30 years and less than 35 years	878	432	387	55	4					
35 years and less than 40 years	872	315	347	174	34	2				
40 years and less than 45 years	907	283	318	208	84	12	2			
45 years and less than 50 years	762	177	244	184	118	27	8	4		
50 years and less than 55 years	607	150	169	119	109	31	25	4		
55 years and less than 60 years	433	84	101	97	84	26	27	14		
60 years and less than 65 years	272	42	51	55	63	28	19	14		
65 years and less than 70 years	193	24	33	43	45	18	14	16		
70 years and less than 75 years	111	8	22	25	28	12	11	5		
75 years and less than 80 years	32	3	2	6	11	4	1	5		
80 years and over	8	1	••••	2	1	1	••••	3		
Total	6,064	2,388	1,789	973	5 81	161	107	65		

Average age of entrants during six-year period ending June 30, 1914....34.4 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15e

City of New York Employees' ("Grady") References Fund

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

EXEMPT EMPLOYEDS

	Total	Length of Service								
Present Age		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over		
15	66	66								
15 years and less than 20 years	264	238	26		• • • •			••••		
20 years and less than 25 years	352	228	114	10			• • • • •	••••		
25 years and less than 30 years	343	220	85	31	6	1		••••		
30 years and less than 35 years	332	201	75	42	9	5	••••	••••		
35 years and less than 40 years	353	181	86	37	39	7	3	••••		
40 years and less than 45 years	279	123	66	53	28	8	1	••••		
45 years and less than 50 years	217	78	54	86	28	12	6	3		
50 years and less than 55 years	134	52	27	31	18	3	3	•		
55 years and less than 60 years	70	22	16	15	10	3	٥	4		
60 years and less than 65 years	56	12	7	8	15	4	5	5		
65 years and less than 70 years		6	2	5	1 4	5	1	2		
70 years and less than 75 years	25	_	Z		_	•	1	2		
75 years and less than 80 years		1		5	1			• • • •		
80 years and less than 85 years	2	••••		1	1			••••		
Total	2,500	1,428	558	274	159	48	19	14		

Average age of entrants not developed.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 15f

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Active Force as of June 30th, 1914, Classified by Age and Length of Service 1

CIVIL WAR VETERANS²

		Length of Service								
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Less Than 30	30 and Over		
60 years and less than 65 years 65 years and less than 70 years 70 years and less than 75 years		27 32	6 46 57	2 44 66	74 99	1 11 37	 6 22	1 10 11		
75 years and less than 80 years 80 years and less than 85 years 85 years and over		1	9 1 	22 4 1	41 5 	5 2 1		7		
Total	657	64	119	139	219	57	30	29		

¹Compiled by mechanical tabulation of census cards taken on June 30, 1914.

²These Civil War veterans have also been included in the preceding tables 15 to 15 e.

TABLE 16

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

		Length of Service							
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20	20 and Less Than 25	25 and Over		
17 years and less than 20 years	1	1							
20 years and less than 25 years	122	122							
25 years and less than 30 years	456	381	74	1					
30 years and less than 35 years	584	314	211	57	2				
35 years and less than 40 years	812	341	238	167	64	2			
40 years and less than 45 years	929	244	292	183	180	29	1		
45 years and less than 50 years	844	176	237	171	208	46	6		
50 years and less than 55 years	814	90	233	160	266	57	8		
55 years and less than 60 years	502	34	132	108	185	35	8		
60 years and less than 65 years	259	9	39	53	109	38	11		
65 years and less than 70 years	83	2	16	22	26	14	3		
70 years and less than 75 years	15		1	4	7	2	1		
75 years and less than 80 years	3		2		1				
80 years and less than 85 years	2			• • • • •	1		1		
Total	5,426	1,714	1,475	926	1,049	223	39		

Average age of entrants during six-year period ending June 30, 1914.....33.9 years.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 17

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

	Total	Length of Service *							
Present Age		Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20		25 and Over		
20 years and less than 25 years		1							
25 years and less than 30 years	10	6	3	1					
30 years and less than 35 years	27	11	13	3					
35 years and less than 40 years		4	12	8					
40 years and less than 45 years		5	8	10	12	9			
45 years and less than 50 years	45	4	11	8	13	6	3		
50 years and less than 55 years	42	1	7	5	10	11	8		
55 years and less than 60 years	49	1	6	4	13	10	15		
60 years and less than 65 years	18		3	3	4	2	6		
65 years and less than 70 years	20	1		2	6	6	5		
70 years and less than 75 years	9			1	2		6		
75 years and less than 80 years	3						3		
80 years and less than 85 years	1				1				
85 years and less than 90 years	1	••••				1			
Total	294	34	63	45	61	45	46		

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Twelve years' maximum of prior service included.

TABLE 18

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Active Force as of June 30, 1914, Classified by Age and Length of Service ¹

			1	ength o	f Servi	X	
Present Age	Total	Less Than 5 Years	5 and Less Than 10	10 and Less Than 15	15 and Less Than 20		25 and Over
25 years and less than 30 years	2 15 28 20 22 13 5 8 11 10	2 11 15 10 6 1 1 	10 6 8 5 3 1 4 4	2 3 1 1	1 4 5 3 1 3 2 2	3 1 1 1	3
Total	138	51	46	8	21	7	5

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

SEPARATION OF EMPLOYEES FROM ACTIVE SERVICE

Tables 19 to 21

TABLE 19

1

NUMBER OF EMPLOYEES WHO SEPARATED FROM ACTIVE SERVICE WITH AND WITHOUT PENSION DURING THE SIX-YEAR PERIOD FROM JULY 1, 1908, 1914.

Pension Fund Bervice on June 30, 100.4	Employees Act	Active Service Without Pension	Active Service Without Pension	Ser.	Employees Who Retired From Service With Pension	ed From don	Total Number of
	otive on 89, Resigns tions	ione Dismissale	Desths	"Superar- nustion" Retirements	"Disability in Performance of Duty" Retirements	"Ordinary Disability" Retirements	Separations During 6 Years Ending June 30, 1914
1. Police Pension Fund 10,788 2. Fire Department Relief Fund 5,009	788 811 000,	138	161	373 364	8 21	1,206	2,980 938
S. Tosobers' Retirement Fund: 2,608 Women. 17,990	900 8,102	40	8 2	79 283	::	11 808	264 4,218
peat Fund	867 865 895 807 818 80	8 II ::	100	Z 00 00	10 : :		\$ 8 8 8
Activement Fund:		-	1,877	::	::	8 -	96 868 868
Clerks, Men. 9,745 Clerks, Women. 2,683 Mechanics. 6,064	745 4,393 582 673 064 2,440		8 % 3			3°2	5,821 781 8,868
	• •		(*) 487 17	8 : :	: • : :	365 965 1	3,075 12 18 18
Total, All Funds (Exclusive of Elective and Appointive) 76,574	574 16,539	6,647	4,261	1,898	110	2,096	30,047

1 Compiled by mechanical tabulation of census cards covering period of six years from July 1, 1908, to June 30, 1914.

The experience of exempt employees has not been separately treated.

TABLE 20

POLICE PENSION FUND

Number of Members of the Uniformed Force Who Withdrew from the Active Service for Various Causes During the Years 1900 to 1914 (inclusive) ¹

Year	Death	Retire- ment	Resig- nation	Dis- missal	Total With- drawals	Strength of Force ²
1900 1901	92 116	44 71	11 11	21 32	168 230	7,427 7,511
1902	79	134	21	88	322	7,674
1903	79	194	34	91	398	8,176
1904	91	153	17	23	284	8,273
1905	77	255	28	45	405	8,860
1906	73	311	49	53	486	8,874
1907	91	228	71	80	470	9,462
1908	82	160	37	166	445	10,013
1909	67	255	34	131	487	10,183
1910	84	227	37	66	414	10,178
1911	78	360	75	80	593	10,208
1912	73	298	74	113	558	10,374
1913	61	390	107	95	653	10,844
1914	79	118	65	68	330	10,708
Total	1,222	3,198	671	1,152	6,243	•••••

¹ Compiled from annual reports of the department.

³ As of December 31 of the years indicated.

TABLE 20a

POLICE PENSION FUND

Number of Members of the Uniformed Force Who Died During the Years 1900 to 1914

(inclusive) 1

	Nı	ımber of Deat	hs	
Year	In Per- formance of Duty	Other Causes	Total	Strength of Force ²
1900	3	89	92	7,427
1901	1	115	116	7,511
1902	2	77	79	7,674
1903	3	76	79	8,176
1904	5	86	91	8,273
1905	4	73	77	8,860
1906	3	70	73	8,874
1907	5	86	91	9,462
1908	3	79	82	10,013
1909	2	65	67	10,183
1910	2	82	84	10,178
1911	1	77	78	10,208
1912	3	70	73	10,374
1913	7	54	61	10,844
1914	7	72	79	10,708
Total	51	1,171	1,222	

¹ Compiled from the annual reports of the department.

As of December 31st of the years indicated.

TABLE 21
FIRE DEPARTMENT RELIEF FUND

Number of Members of the Uniformed Force Who Withdrew from the Active Service for Various Causes, During the Years 1900 to 1914 (inclusive) ¹

Year	Death	Retire- ment	Resigna- tion	Dismissal	Total With- drawals	Strength of Force ²
1900	25	53	2	22	102	2,438
1901	28	65	14	18	125	2,596
1902	25	66	9	25	125	2,622
1903	24	57	31	8	120	2,982
1904	36	46	25	16	123	3,296
1905	34	28	49	19	130	3,565
1906	22	59	17	34	132	3,797
1907	40	73	37	20	170	4,118
1908	23	63	19	37	142	4,247
1909	27	85	13	18	143	4,352
1910	29	112	37	19	197	4,324
1911	19	110	8	13	150	4,422
1912	22	76	12	22	132	4,417
1913	33	111	57	23	224	4,956
1914	32	61	22	31	146	5,004
Total	419	1,065	352	325	2,161	

¹ Compiled from the annual reports of the department.

² As of December 31st of the years indicated.

FIRE DEPARTMENT RELIEF FUND

Number of Members of the Uniformed Force Who Died During the Years 1865 to 1914

(inclusive) 1

TABLE 21a

	Nun	ber of Deaths		
Year	In Performance of Duty	From Other Causes	Total	Strength of Force
1865	4		4	555
1866	2	4	6	564
1867	1	4	5	521
1868	1	4	5	592
1869	2	6	8	599
1870	1	5	6	596
1871	1	8	9	596
1872	2	3	5	596
1873	2	9	11	651
1874	1		1	719
1875	3	10	13	745
1876	3	5	8	74
1877	l	7	7	75
1878	1	4	5	72
1879	3	4	7	72
1880	6	3	9	74
1881		7	7	76
1882	2	4	6	82
1883	1	7	8	89
1884	1	7	8	93
1885	3	13	16	94
1886	2	7	9	98
1887	4	13	17	99
1888	1	10	11	1,07
1889	1	9	10	1.08
1890	2	12	14	1,14
1891	1	14	15	1,14
1892	2	9	11	1,16
1893		14	14	1,16
1894	3	17	20	1,21
1895	2	15	17	1,26

TABLE 21a (Continued)

FIRE DEPARTMENT RELIEF FUND

Number of Members of the Uniformed Force Who Died During the Years 1865 to 1914 (Inclusive) ¹

	Num	ber of Deaths		Steen at h
Year	In Performance of Duty	From Other Causes	Total	Strength of Force ²
1896	2	6	8	1,276
1897	3	8	11	1,236
1898	1 1	15	16	2,212
1899		20	20	2,419
1900	6	19	25	2,438
1901	6	22	28	2,596
1902	6	19	25	2,622
1903	5	19	24	2,982
1904	10	26	36	3,296
1905	8	26	34	3,565
1906	7	15	22	3,797
1907	11	29	40	4,118
1908	7	16	23	4,247
1909	3	24	27	4,352
1910		22	29	4,324
1911	6	13	19	4,422
1912	. 7	15	22	4,417
1913	5	28	33	4,956
1914	1	31	32	5,004
Total	. 159	607	766	

¹ Compiled from the annual reports of the department.

As of December 31st of the years indicated.

PENSIONERS

December 31, 1914

DISTRIBUTION BY

AMOUNTS RECEIVED

1,000

Less Than :1,250

T 325

12

· 12

· C P

1:

Tables 22 to 24

SUMMARY

Employees' Pensions	Number	Per Cent. of Total
\$150 and less than \$600	983	17.0
\$600 and less than \$800	3,230	55.9
\$800 and less than \$3,500	1,560	27.1
\$3,500 to \$6,000	6	
Total	5,779	100.0

 Average pension
 \$759.65

 Total charge
 \$4,390,018.49

Dependents' Pensions	Number	Per Cent. of Total
\$50 and less than \$300	107	8.8 86.9 4.3
Total	2,453	100.0

Average pension.....\$305.40
Total charge......\$749,148.00

	\$1,000 and Less Than \$1,250	\$1,250 and Less Than \$1,500	\$1,500 and Less Than \$1,750	\$1,750 and Less Than \$2,000	\$2,000 and Less Than \$2,500	\$2,500 and Less Than \$3,000	\$3,000 and Less Than \$3,500	\$3,500	\$4,200	\$5,000	\$6,000
Police Pension Former Emp Dependents	824	81		18			1	<u></u>		::::	<u></u>
Total.		81	8	18	••••	4	1	••••	••••	••••	••••
Fire Department Former Emp Dependents.	124	80 80	37 1 		<u></u> 5	6	 8		1	····	<u>1</u>
Teachers' Retire	98	88	45	••••	6	••••	1	••••	••••	1	••••
Former Emp Dependents	12	5 5	<u>4</u>	1		 2		1		····	
College of the Fund: Former Emp	2		1	••••	••••	••••		••••		••••	••••
City of New Y tirement i Former Emp	14	6	7	2	1		1	2	••••	••••	••••
Department of Pension i Former Empi Dependents	6	<u>.</u>	····	<u></u>	<u></u>		<u>::::</u>	<u></u>	<u>::::</u>	<u>::::</u>	
Total		••••	••••	2	••••	••••	••••	••••	••••	••••	••••
Supreme Court Fund: Former Emp	2	2	••••	••••	2	••••	••••	••••	••••	••••	••••
Supreme Court Fund: Former Emp			••••					••••	••••	••••	••••
Total All Pensi Former Emp Dependents	582	257 	97 1	28	14	12			1		1
Total	594	257	98	28	14	12	6	8	1	1	1
Per Cen	7.2	3.1	1.2	.8	.2	.1	.1	••••	••••		••••

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				_						
	\$1,250 and Less Than \$1,500	\$1,500 and Loss Than \$1,750	\$1,750 and Less Than \$2,000	\$2,000 and Less Than \$2,500	\$2,500 and Less Than \$3,000	\$3,000 and Less Than \$3,500	\$8,500	\$4,200	\$6,000	\$6,000
Police F	81	8	18		4	1				
Fire Dq	80	87		5	6	8		1		1
Teaches	88	45	••••	6		1			1	
Health!	5	4	1		2		1			
College Fund,	••••	1	••••		••••		···•			••••
City of 1	6	7	2	1		1	2	••••		
Departs Pensis			2		••••	••••				••••
Supremi Fund.	2			2						
Suprem4 Fund 4	••••	·			••••		••••			
T	257	97	23	14	12	6	8	1	1	1
P	4.4	1.7	.4	.3	.2	.1				

\$600 and Less Than \$700	\$700 and Less Than \$800	\$800 and Less Than \$900	\$900 and Less Than \$1,000	\$1,000 and Less Than \$1,250	\$1,250 and Less Than \$1,500	\$1,500 and Less Than \$1,750
28				1		
6	22	5	5	11		1
••••		••••			••••	
••••	••••	••••	••••	••••	••••	••••
84	22	5	5	12		1
1.8	.9	.2	.2	.5		

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PENSIONERS

June 30, 1914

DISTRIBUTION BY

PRESENT AGE AND CAUSE OF RETIREMENT

Tables 25 to 33

SUMMARY, BY CAUSE OF RETIREMENT

	Total	Number of						
Pension Fund	Number of Pen- sioners	Service Pen- sioners	Dis- ability Pen- sioners	Widows	Chil- dren	Depend- te ent Parents		
1. Police Pension Fund	4,282	851	1,865	1,441	124	1		
2. Fire Department Relief Fund.	1,686	582	317	669	70	48		
3. Teachers' Retirement Fund	1,521	1,232	289			.		
Men	82	71	11		• • • •			
Women	1,439	1,161	278		••••			
Fund	93	73	8	10	1	1 1		
Men	79	71	7	10	1			
Women	14	2	1	10	4	1		
5. College of the City of N. Y.	14		-	10	••••	1 1		
Retirement Fund	4	4		1		ł		
6. City of New York Employees'	-	*	••••		••••			
("Grady") Retirement				1				
Fund	106		106			1 .		
7. Department of Street Clean-	100	• • • • • • • • • • • • • • • • • • • •	200			''		
ing Relief and Pension								
Fund	437	21	300	106	7	3		
8. Supreme Court, First Depart-					•	•		
ment. Retirement Fund	9		9	l l		١		
9. Supreme Court, Second De-				''''		''		
partment, Retirement						1		
Fund	1		1	l l		 		
Total, All Funds	8,139	2,763	2,895	2,226	202	53		

SUMMARY (Continued), BY PRESENT AVERAGE AGE

	Average Age on June 30, 1914							
Pension Fund	Service Pen- sioners	Dis- ability Pen- sioners	Widows	Chil- dren	Dependent ent Parents			
1. Police Pension Fund	67.0	53.1	55.3	13.2	82.0			
2. Fire Department Relief Fund	58.6	53.5	53.1	12.9	68.7			
8. Teachers' Retirement Fund	64.9	52.0						
Men	71.4	57.0	1					
Women	64.5	51.8						
4. Health Department Pension Fund	57.9	51.4	49.6	10.0	65.0			
Men	58.0	53.0	1	10.0				
Women	56.5	40.0	49.6	• • • •	65.0			
5. College of the City of New York					i			
Retirement Fund	74.8							
6. City of New York Employees'			1 1		ł			
("Grady") Retirement Fund		71.6		••••				
7. Department of Street Cleaning			1 1		ł			
Relief and Pension Fund	67.9	61.8	49.9	16.3	72.7			
8. Supreme Court, First Depart-			1		l			
ment, Retirement Fund	• • • •	67.0		• • • •				
9. Supreme Court, Second Depart-					1			
ment, Retirement Fund	••••	76.0		••••				

TABLE 25
POLICE PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

				er of Dis Pensioner			No. of	No. of
Present Age	Total	No. of Service Pen- sioners	Actual Perform- ance of Duty	Other than Actual Perform- ance of Duty	Total Dis- ability Pen- sioners	No. of Widow Pen- sioners	Chil- dren Pen- sioners	Dependent Parent Pensioners
Under 18 years	124						124	
25 years and less than 30 years	13	l	6	1	7	6		
30 years and less than 35 years	63		18	3	21	42		
35 years and less than 40 years	144	l	34	19	53	91	l	
40 years and less than 45 years	286		17	130	147	139		
45 years and less than 50 years	546	l	11	311	322	224		l
50 years and less than 55 years	819	l	6	579	585	234	l	l
55 years and less than 60 years	735	137	4	421	425	173		l
60 years and less than 65 years	478	145	4	149	153	180	l	١
65 years and less than 70 years	521	276	5	85	90	155		
70 years and less than 75 years	350	199	2	31	33	118		
75 years and less than 80 years	133	65	3	17	20	48		
80 years and less than 85 years	48	23	2	2	4	20		1
85 years and less than 90 years	19	6	1	4	5	8		
90 years and less than 95 years	2		l			2		
95 years and over	1	••••			••••	1	••••	
Total	4,282	851	113	1,752	1,865	1,441	124	1
Average Present Age		67.0	43.9	53.7	53.1	55.3	13.2	82.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 26

FIRE DEPARTMENT RELIEF FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and

Cause of Retirement 1

		No. of Service Pen- sioners Perfor	Number of Disability Pensioners				No. of	No. of
Present Age	Total		Actual Perform- ance of Duty	Other than Actual Perform- ance of Duty	Total Dis- ability Pen- sioners	No. of Widow Pen- sioners	Chil- dren Pen- sioners	Dependent ent Parent Pen- sioness
T-1-10	70						:	
Under 18 years	70 12	••••			• • • • •	12	70	
25 years and less than 30 years	56		2	7	9	47		
30 years and less than 35 years			5	29	34	49	1	
35 years and less than 40 years	83	9	17	50	67	82		
40 years and less than 45 years	158 199	_	12	24	36	78	••••	
45 years and less than 50 years		85	14					l;
50 years and less than 55 years	265	140		20	34 27	88 81		8
55 years and less than 60 years	221	109	8 7	19		92		8
60 years and less than 65 years	199	71	9	21 25	28 34	76		11
65 years and less than 70 years	203	82	9		28			1
70 years and less than 75 years	136	62	_	19		38		8
75 years and less than 80 years	66	21	4	12	16	21		8
80 years and less than 85 years	16	3	1	8	4	5		-
85 years and less than 90 years	1							1
90 years and over	1							1
Total Number	1,686	582	88	229	317	669	70	48
Average Present Age		58.6	54.3	48.9	53.5	53.1	12.9	68.7

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 27
TRACHERS' RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

MEN

Present Age	Total	Number of Service Pensioners	Total Dis- ability Pensioners
45 years and less than 50 years. 50 years and less than 55 years. 55 years and less than 60 years. 60 years and less than 65 years. 65 years and less than 70 years. 70 years and less than 75 years. 75 years and less than 80 years. 80 years and less than 85 years. 85 years and less than 90 years. 90 years and over.	3 6 13 12 18 15	2 2 12 11 17 15 11	8 1 4 1 1 1
Total	82 69.5	71 71.4	11 57.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 27a

TEACHERS' RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement 1

WOMEN

Present Age	Total	Number of Service Pensioners	Number of Disability Pensioners
85 years and less than 40 years			3
40 years and less than 45 years	37 78	2	37 76
45 years and less than 50 years	168	87	81
55 years and less than 60 years	269	228	41
60 years and less than 65 years	299	279	20
65 years and less than 70 years	281	269	12
70 years and less than 75 years	191	186	5
75 years and less than 80 years	87	84	3
80 years and less than 85 years	22	22	
85 years and less than 90 years	2	2	
90 years and over	2	2	•••••
Total	1,439	1,161	278
Average present age	62.1	64.5	51.8

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 28
HEALTH DEPARTMENT PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

MEN

		No. of Service Pen- sioners	Number of Disability Pensioners				No. of	No. of
Present Age	Total		Actual Perform- ance of Duty	Other Than Actual Perform- ance of Duty	Total Dis- ability Pen- sioners	No. of Widow Pen- sioners	Children dren Pen- sioners	Dependent Parent Pen- sioners
Under 18 years	1						1	
20 years and less than 25 years			ļ					
25 years and less than 30 years					l			
30 years and less than 35 years					l	••••		
35 years and less than 40 years	2	i	· · · i		1	::::	::::	
40 years and less than 45 years	4	3	l î		l î	::::		
45 years and less than 50 years	13	11	2		2	::::		
50 years and less than 55 years	13	13	-		~		l	
55 years and less than 60 years	15	15						
60 years and less than 65 years	12	10	2		2			
65 years and less than 70 years	7	7			"			
70 years and less than 75 years	10	9	i		1		••••	l
75 years and less than 80 years	10	"	1 -					
80 years and less than 85 years	2	2						
ou years and less than on years			••••	••••		••••	••••	••••
Total	79	71	7		7		1	
Average present age		58.0	53.0		53.0		10.0	

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 28a
HEALTH DEPARTMENT PERSON FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement 1

WOMEN

				er of Dis Pensioner			No. of	No. of
Present Age	Total	No. of Service Pen- sioners	Actual Perform- ance of Duty	Other Than Actual Perform- ance of Duty	Total Dis- ability Pen- sioners	No. of Widow Pen- sioners	Chil- dren Pen- sioners	Dependent Parent Pensioners
- 1 40								
Under 18 years	• • • •	• • • •	• • • •		• • • •	• • • •	• • • •	• • • • •
20 years and less than 25 years				• • • • •	• • • • •	• • • •	• • • •	• • • • •
25 years and less than 30 years	• • • •				• • • •	• • • •	••••	
30 years and less than 35 years								
35 years and less than 40 years	1			'		1		
40 years and less than 45 years	5		1		1	4		
45 years and less than 50 years	1					1		
50 years and less than 55 years	1	1	١					
55 years and less than 60 years	2	l				2		l
60 years and less than 65 years	2	1	 			1		l
65 years and less than 70 years	2					. 1		1
Total	14	2	1		1	10		1
Average present age	51.0	56.5	40.0		40.0	49.6		65.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 29
COLLEGE OF THE CITY OF NEW YORK RETTREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

Present Age	Number of Service Pensioners
70 years and less than 75 years	
75 years and less than 80 years	1
80 years and less than 85 years	1
Total	4
Average present age	74.8

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 30
City of New York Employees' ("Grady") Retirement Fund

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

Disability Pensioners

		Mechan-	Labo	rers	Clerks		
Present Age	Total	ics	Men	Women	Men	Women	
FOrman and last than EE mann							
50 years and less than 55 years 55 years and less than 60 years	5	1 1			3		
	_	1	1		3		
60 years and less than 65 years	10	2	1		1		
65 years and less than 70 years	22	9	11		2		
70 years and less than 75 years	36	9	11	1	15		
75 years and less than 80 years	20	4	7		8	1	
80 years and less than 85 years	10		4		5	1	
85 years and over	2		1		1		
Total	106	26	36	1	41	2	
Average present age	71.6	69.2	72.4	74.0	72.1	79.0	

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 31

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause

of Retirement 1

Number of Disability Pensioners No. of No. of No. of No. of Depend-Chil-Bervice Widow Total Total Present Age dren Pen-Than Pen-Die Pen-Perform ability alopera Perform ance of **sioner** Pen-Duty ance of aine ere Duty 7 Under 18 years..... 7 20 years and less than 25 years... 2 25 years and less than 30 years. 2 30 years and less than 35 years.. 5 5 13 35 years and less than 40 years. 1 2 3 10 32 40 years and less than 45 years.. 1 13 14 18 31 45 years and less than 50 years... 1 17 13 18 50 years and less than 55 years.. 49 24 24 25 55 years and less than 60 years... **52** 36 37 14 1 1 60 years and less than 65 years.. 94 7 74 74 13 89 82 65 years and less than 70 years. 4 2 80 3 70 years and less than 75 years. 44 **32 32** 8 3 1 75 years and less than 80 years. 15 2 13 13 80 years and less than 85 years. 2 2 2 85 years and less than 90 years. 2 1 1 1

67.9

21

6

53.2

294

62.0

300

61.8

106

49.9

7

16.3

3

72.7

437

58.5

Total....

Average Present Age....

¹Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 32
SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Classified by Present Age and Cause of Retirement ¹

. Present Age	Number of Disability Pensioners
50 years and less than 55 years	2
60 years and less than 65 years	3 1
75 years and less than 80 years	1
Total	9
Average present age	67.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 33

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Pensioner on the Rolls on June 30, 1914. Present Age and Cause of Retirement.

Number	1
Present Age	76 years

SERVICE PENSIONERS

June 30, 1914

DISTRIBUTION BY

YEARS OF SERVICE AND AGE AT APPOINTMENT AND RETIREMENT

Tables 34 to 39

SUMMARY

	Pensioned Employ-					
Pension Fund	ees on the Rolls on June 30, 1914	Number	of Total	Average Age at Appoint- ment	Average Service	Average Age at Retire- ment
1. Police Pension Fund	2.716	851	31.3	27.9	28.5	56.4
2. Fire Department Relief Fund.	, ,	582	64.7	26.7	25.3	52.0
3. Teachers' Retirement Fund	1.521	1,232	81.0	20.1	20.0	
Men	82	71	86.6	33 .1	33 .8	66.9
Women	1,439	1,161	80.7	21.2	36.1	57. 3
4. Health Dept. Pension Fund	81	73	90.1			
Men	78	71	91.0	31.2	25.2	54.4
Women	8	2	66.7	25.5	28.5	54.0
5. College of the City of N. Y.		_			20.0	04.0
Retirement Fund	4	4	100.0	59.0	12.3	71.3
6. City of New York Employ- ees' ("Grady") Retire- ment Fund		-	100.0	55.5	-2.0	
7. Dept. of Street Cleaning Re-		••••	••••	• • • • • • • • • • • • • • • • • • • •	••••	• • • • •
lief and Pension Fund	321	21	6.5	40.4	26.7	67.1
8. Supreme Court, First Dept.,		~-	0.0	20.2	20.1	V
Retirement Fund	9					
9. Supreme Court, Second Dept.,					••••	
Retirement Fund	1					
Total	5,658	2,763	48.8	••••	••••	••••

TABLE 34

POLICE PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years	11	48.5	60.3
15 years and less than 20 years	10	44.2	61.0
20 years and less than 25 years	218	27.3	48.8
25 years and over	612	27.4	58.9
Total	851	27.9	56.4

TABLE 35

FIRE DEPARTMENT RELIEF FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	at
20 years and less than 25 years	337	26.9	48.4
25 years and over	245	26.3	57.1
Total	582	26.7	52.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 36 TEACHERS' RETIREMENT FUND

Man

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. 1

Years of Service Prior to Retirement ³	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years	3²	57.0	70.3
15 years and less than 20 years	10°	48.3	64.9
20 years and less than 25 years		40.0	62.9
25 years and less than 30 years	5 ²	37.6	64.6
30 years and over	45	26.4	68.1
Total	71	33.1	66.9

TABLE 36a TEACHERS' RETIREMENT FUND WOMEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. 1

Years of Service Prior to Retirement 2	Number	Average Age at Appointment	at
5 years and less than 10 years	23	53.0	61.5
10 years and less than 15 years	8 ²	45.9	59.1
15 years and less than 20 years	26°	39.9	56.6
20 years and less than 25 years	27°	37.3	59.6
25 years and less than 30 years	40°	30.9	58.5
30 years and over	1,058	19.7	57.1
Total	1,161	21.2	57.3

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

²Includes only service in New York city schools. Twenty-six teachers were credited with "outside" experience to make them eligible for retirement.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

²Includes only service in New York city schools. One hundred and three teachers were credited with "outside" experience to make them eligible for retirement.

TABLE 37

HEALTH DEPARTMENT PENSION FUND

MEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. 1

Years of Service Prior to Retirement	Number	at	Average Age at Retirement
20 years and less than 25 years	53 18	31.4 30.7	52.7 59.5
Total	71	31.2	54.4

TABLE 37a

HEALTH DEPARTMENT PENSION FUND

WOMEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
25 years and over	2	25.5	54.0

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

¹ Compiled by mechanical tabulation of census cards taken on June 30 1014.

TABLE 38 COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. 1

Years of Service Prior to Retirement ²	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years		60.0 56.0	71.8 71.0
Total	4	59.0	71.3

TABLE 39 DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired on "Service" Pensions. Classified by Years of Service and Age at Appointment and Retirement. 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
20 years and less than 25 years	10	43.4	64.8
25 years and over	11	37.7	69.1
Total	21	40.4	67.1

Average Service.....

26.7 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Service outside of City College not included.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

DISABILITY (In Performance of Duty) PENSIONERS

June 30, 1914

DISTRIBUTION BY

YEARS OF SERVICE AND AGE AT APPOINTMENT AND RETIREMENT

Tables 40 to 43

SUMMARY

	Pensioned Employ-	disabili	yees Pensi ty incurre			
Pension Fund	ees on the Rolls on June 30, 1914		Per Cent. of Total Pension Roll		Average Service	Average Age at Retire- ment
1. Police Pension Fund	2,716	113	4.2	28.2	7.6	35.8
2. Fire Department Relief Fund.	899	88	9.8	27.1	14.0	41.1
3. Health Department Pension			•.•			
Fund	81	8	9.9	37.4	7.1	44.5
Men	78	7	9.0	3 8. 3	8.0	46.3
Women	3	1	<i>33.3</i>	29.0	3 .0	38.0
4. Department of Street Cleaning						
Relief and Pension Fund	321	6	1.9	42.5	10.3	52.8
Total	4,017	215	5.4			

TABLE 40 POLICE PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for Disability Incurred in Performance of Duty

Classified by Years of Service and Age at Appointment and Retirement 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	at
0 years and less than 5 years	20	25.6	28.0
5 years and less than 10 years	77	28.5	36.1
10 years and less than 15 years		30.2	40.3
15 years and less than 20 years	••	l	
20 years and less than 25 years	2	25.5	48.0
25 years and over	2	36.0	63.5
Total	113	28.2	35.8

TABLE 41 FIRE DEPARTMENT RELIEF FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for Disability Incurred in Performance of Duty

Classified by Years of Service and Age at Appointment and Retirement 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	at
0 years and less than 5 years	2	26.0	29.5
5 years and less than 10 years	25	27.2	34.4
10 years and less than 15 years	25	27.0	38.6
15 years and less than 20 years	24	26.3	42.0
20 years and less than 25 years	2	34.5	55.5
25 years and over	10	28.1	61.3
Total	88	27.1	41.1

Average Service......14.0 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 42

HEALTH DEPARTMENT PENSION FUND

MEN

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for Disability Incurred in Performance of Duty

Classified by Years of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	at
0 years and less than 5 years	1	33.0	36.0
5 years and less than 10 years		45.0	52.5
10 years and less than 15 years	1	24.0	26.0
15 years and less than 20 years	• • • •		
20 years and less than 25 years	1	31.0	52.0
Total	7	88.3	46.3

Average Service......8.0 years

TABLE 42a

HEALTH DEPARTMENT PENSION FUND

WOMAN

Pensioner on the Rolls on June 30, 1914, Who Was Retired for Disability Incurred in Performance of Duty

Years of Service and Age at Appointment and Retirement

Number	 		1
Age at Appointment	 	2	9 years
Service Prior to Retirement	 		3 years
Age at Retirement		9	22 voore

TABLE 43

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for Disability Incurred in Performance of Duty

Classified by Years of Service and Age at Appointment and Retirement 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	at
0 years and less than 5 years	1	37.0	39.0
5 years and less than 10 years	$ar{2}$	53.5	61.0
10 years and less than 15 years	<u> </u>	33.0	46.0
15 years and less than 20 years	2	39.0	55.0
Total	6	42.5	52.8

Average Service......10.3 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

DISABILITY (ORDINARY) PENSIONERS

June 30, 1914

DISTRIBUTION BY

YEARS OF SERVICE AND AGE AT APPOINTMENT AND RETIREMENT

Tables 44 to 50

SUMMARY

	Pensioned Employees	Employees Pensioned Un "Ordinary" Disability, Performance of			Not Incurred in		
Pension Fund	on the Rolls on June 30, 1914	Number	Per cent. of Total Pension Roll		Average Service	Average Age at Retire- ment	
1. Police Pension Fund	2,716 899	1,752 229	64.5 25.5	27.4 28.2	21.2 16.1	48.6 44.3	
 Fire Dept. Relief Fund Teachers' Ret'ment Fund. 	1,521	289	19.0				
Men		11	13.4	36.5	18.5	54.8	
Women		278	19.5	24.4	24.0	48.4	
4. Health Dept. Pension Fund			10.0	24.4	24.0	40.4	
Men	1		::::::				
Women							
5. College of the City of New							
York Ret'ment Fund	4						
6. City of New York Employ-				}			
ees' ("Grady") Retire-	1						
ment Fund	106	106	100.0	37.1	34.0	71.1	
7. Department of Street Clean-					0 = 10		
ing Relief and Pension		ł		Ì			
Fund	321	294	91.6	44.6	16.6	61.2	
8. Supreme Court, 1st Dept.,							
Retirement Fund		9	100.0	39.0	27.2	66.2	
9. Supreme Court, 2nd Dept.,		1		i		ł	
Retirement Fund	1	1	100.0	48.8	26.6	75.4	
				ļ		<u> </u>	
Total	5,658	2,680	47.4				

TABLE 44 POLICE PENSION FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
10 years and less than 15 years	147	28.5	41.0
15 years and less than 20 years	330	28.2	45.5
20 years and less than 25 years	948	27.4	49.1
25 years and over	327	25 .8	53.7
Total	1,752	27.4	48.6

TABLE 45 FIRE DEPARTMENT RELIEF FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement 1

Years of Service Prior to Retirement	Number	Average Age at Appointment	Average Age at Retirement
0 years and less than 5 years	8	27.9	31.3
5 years and less than 10 years	27	30.5	37.3
10 years and less than 15 years	73	27.6	39.9
15 years and less than 20 years	75	29.1	47.1
20 years and less than 25 years	25	27.2	48.6
25 years and over	21	25.0	57.9
Total	229	28.2	44.3

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 46

TEACHERS' RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement 1

MEN

Years of Service Prior to Retirement ²	Number	Average Age at Appointment	at
10 years and less than 15 years	12	53.0	66.0
15 years and less than 20 years	5 ²	35.2	51.4
20 years and less than 25 years	4	36.0	57.0
25 years and less than 30 years	1	26.0	52.0
Total	11	36.3	54.8

TABLE 46a

TEACHERS' RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement 1

WOMEN

Years of Service Prior to Retirement ²	Number	Average Age at Appointment	Average Age at Retirement
0 years and less than 5 years	12	47.0	51.0
5 years and less than 10 years	4 ²	44.0	51.0
10 years and less than 15 years	10 ²	41.9	54.6
15 years and less than 20 years	30 ²	34.7	51.7
20 years and less than 25 years	101	22.9	44.9
25 years and less than 30 years	95	21.3	48.1
30 years and over	37	20.2	54 .0
Total	278	24.4	48.4

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

² Includes only service in New York city schools. Six teachers were credited with "outside" experience to make them eligible for retirement.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

^{*}Includes only service in New York city schools. Forty-five teachers were credited with "outside" experience to make them eligible for retirement.

TABLE 47

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary"

Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	at
20 years and less than 30 years	28 78	46.4 33.8	71.0 71.2
Total	106	37.1	71.1

TABLE 48

Department of Street Cleaning Relief and Pension Fund

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary" Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	at
10 years and less than 15 years	134 65	46.7 44.2 42.9 37.5	59.3 61.3 63.9 64.5
Total	294	44.6	61.2

Average Service......16.6 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

TABLE 49
SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Number of Pensioners on the Rolls on June 30, 1914, Who Were Retired for "Ordinary"

Disability, Classified by Length of Service and Age at Appointment and Retirement ¹

Years of Service Prior to Retirement	Number	Average Age at Appointment	at
15 years and less than 20 years	1	30.0	48.0
20 years and less than 25 years	1	42.0	66.0
25 years and over	7	39.9	68.9
Total	9	39.0	66.2

Average Service......27.2 years

TABLE 50

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Pensioner on the Rolls on June 30, 1914, Who Was Retired for "Ordinary" Disability.

Length of Service and Age at Appointment and Retirement

Number	1
Age at Appointment48.	8 years
Service Prior to Retirement26.	6 years
Age at Retirement75.	4 years

¹ Compiled by mechanical tabulation of census cards taken on June 30, 1914.

RECEIPTS AND DISBURSEMENTS

1857 to 1914

ANALYZED BY

SOURCES OF INCOME AND OBJECTS OF EXPENDITURE

Tables 51 to 62

SUMMARY OF TOTALS:

	Since Establi	shment	1914		
Items	Amount	Per Cent. of Total	Amount	Per Cent. of Total	
Receipts:					
Employees' Contributions	\$ 7,349,058.13	12.24	\$754,724.38	14.13	
Indirect City Contributions	42,255,968.12	70.39	2,803,058.60	52.47	
Direct City Contributions	7,845,448.58	13.07	1,664,552.36	31.15	
Interest	2,271,951.22	3.79	118,594.30	2.22	
Miscellaneous	305,846.40	.51	1,578.01	.08	
Total Receipts	\$60,028,272.45	100.00	\$5,342,507.65	100.00	
Disbursements:	A FA F OO OOF O		47 0 7 0 10 7 01		
Pension Payments Administrative Expenses	\$56,783,095.94 133,280.95		\$5,053,167.84 6,463.77		
Total Disbursements	\$ 56,916,376.89		\$5,059,631.61		

Balance in Funds, December 31, 1914......\$3,111,895.56

•				
		·		
			•	

d by Sources of Income and Objects of Expenditure

				<u> </u>			
			Dissursem	ENTS			
Year	Em			Total Disbur	sements	Balance at End of	Year
	Cent	Pension Payments	Administrative Expenses, Etc.	Amount	Per Cent. of Receipts	Year	
1857	100					\$423.10	1857
1858	1[00	\$30.00		\$30.00	1.86	2,593.10	1858
1859		240.00	1	240.00	6.58	5,997.47	1859
1860	100	809.31		809.81	16.12	10,211.24	1860
1861	100	1,425.75	\$49.28	1,475.08	14.68	18,786.36	1861
1862	100	2,188.82	V	2,138.82	21.19	26,718.68	1862
1868	100	2,398.58		2,398.58	26.06	83,528.10	1863
1864	100	8.877.49	29.10	8,906.59	19.78	49,418,18	1864
1865	100	6,680.72		6,680.72	25.23	69,216.60	1865
1866	100	7,257.50		7,257.50	16.32	106,424.40	1866-
1867	100	7,870.54	94.50	7,965.04	25.32	129,915.99	1867
1868	····fi00	12,987.18	689.00	13,676.18	42.60	148,339.97	1868
1869		18,906.64	577.00	19,483.64	58.98	164,981.11	1869
1870	100	26,223.88	229.12	26,452.95	85.98	212,051.88	1870-
1871	100	45,664.36	6,867.27	52.531.68	56.04	258,251.07	1871
1872		56,829.08	14,362.40	70,691.43	68.60	298,715.42	1872
1873	fioo	63,242,22	1,234.75	64,476.97	60.97	334,993.26	1873
1874	···•ti00	74,984.55	2,151.45	77,186.00	54.70	398,876.25	1874
1875	100	64,417.71	1,826.01	66,243.72	52.97	457,697.60	1875
1876	100	47.691.26	1,995.28	49,686,49	42.68	524.423.12	1876
1877	100	80,967.99	2,718.54	83,686.53	65.41	568,675.11	1877
1878	···• 100	81,470.85	2,187.25	83,658.10	53.41	641,642.95	1878
1879	····100	96,433,42	1.115.28	97,548,65	58.85	726,928,47	1879
1880	100	124,996.76	112.00	125,108.76	74.22	770,8.5.71	1880-
1881	100	142,641.88	144.50	142,786.38	81.78	802.204.11	1881
1882	fioo	164,009.55	141.00	164,150.55	134.34	760,246.68	1882
1883	fio	197,909.28	407.07	198,316.35	236.92	645,686.86	1883
1884	···• 100	264,049.12	794.85	264,843.97	106.90	628,548.79	1884
1885	···•100	838,528.73	91.10	338,619.83	108.85	602,459.13	1885
1886		407,601.30	119.25	407,720.55	101.32	597,134.82	1886
1	# OO	476 722 81	2.560.16	480 202 07	86 57	671,675,87	1887

----. TABLE 66

Thachers' Represent Fond

Receipts and Disbursements, 1894 to 1914,¹ Analyzed by Sources of Income and Objects of Expenditure

	ements	Per Cent. of . Receipts	20.09 84.34 66.47	32.57 52.58 54.38 80.56 80.73	92.62 88.18 87.38 96.26	86.61 106.12 109.62 1115.88 107.69	91.98
MENTS	Total Disbursements	Amount	\$12,688.34 42,596.07 71,539.49 102,157.04	124,296.18 214,563.57 263,806.28 848,017.13 420,026.99	477,418.74 526,502.36 616,984.54 689,390.64 724,129.78	777,941.85 834,483.49 881,071.98 983,972.19 1,110,803.30	\$10,401,541.08
Disbusantents		Administra- tive Ex- penses				\$141.00 619.90 682.15 417.20 1,929.00	\$4,600.29
		Pension Payments	\$12,638.34 42,595.07 71,539.49 102,157.04	124,396.18 214,663.67 263,805.28 343,017.13 420,026.99	477,418.74 526,502.36 616,984.54 689,380.64 724,129.78	777,800.85 833,863.69 880,389.83 983,554.99 1,108,874.80	\$10,396,940.79
	ipte	Per Cent. of Total	000000	99999	86688	86666	18
	Total Receipts	Amount	\$25,060.33 62,897.08 50,504.04 107,628.38 83,900.37	881,679.11 408,038.56 485,108.40 425,767.18 468,060.22	516,003.28 597,048.00 706,072.85 784,354.89 760,176.06	898,208.94 786,340.54 803,734.45 849,198.48 1,031,422.94	\$11,308,146.65
		Per Cent. of Total		1. 1. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.	7.94 5.98 5.64 6.38	6.80 6.40 7.80 83.80 83.80 83.80	5.08
	Interest	Amount	\$2,961.81 728.20	4,225.28 10,772.76 13,698.70 16,579.30	40,975.63 35,708.15 39,766.94 43,155.13 48,536.63	52,025.16 50,328.61 41,308.67 49,234.85 86,902.17	\$574,095.85
	ns, etc.	Per Cent. of Total	:::::	: : : : 8	: : :8: :	:8 : : :	10.
	Donations, Bequests, etc.	Amount		\$15.00	388.01	441.87	\$1,144.88
RECEIPTS	tributions	Per Cent. of Total	100. 100. 100. 28.89	90.91 86.80 93.10 96.00	92.06 78.50 70.42 71.72 68.70	72.11 67.14 70.28 70.28	
	Indirect City Contributions	Amount	\$25,060.33 62,897.08 50,504.04 63,382.58	346,873.97 354,186.38 451,652.81 406,760.74 426,453.45	475,027.65 468,700.92 497,251.59 562,597.02 532,238.47	647,700.81 627,939.13 547,267.33 542,338.66 724,836.23 1	\$8,510,280.94
	ributions	Per Cent. of Total	88.36	7.90 10.55 4.06 .10	28.94 28.72 24.91	28.28.28 26.28.24 26.	19.65
	Employees' Contributions	Amount	841,283.90 ⁴ 23,868.34	80,479.86 43,079.45 19,741.98 418.14	92,638.98 169,054.42 178,214.78 189,410.96	198,482.87 207,680.08 215,158.45 257,729.97 270,184.44	\$2,222,624.98
	Y Par		1804 1806 1806 1807	1896 1900 1902 1903	1904 1906 1906 1907	1909 1910 1911 1913 1913	Total

¹ As shown for the years 1894 to 1913 in the annual reports of the Teachers' Retirement Fund and for the year 1914 on the books of the Auditor of the Board of Education.

**Increase in this year due to the advance of \$200,000.00 for excise taxes.

**Increase in this year due to the fact that the payment of refunds of absence deductions were postponed.

**Includes contributions made in 1896 which could not be segregated.

TABLE 67

HRALTH DEPARTMENT PENSION FUND

Receipts and Disbursements, 1894-1914, Analyzed by Sources of Income and Objects of Expenditure

SCHOOL STATE	Total Disbursements	Per Cent. Amount of Receipts	20 0100		2,460.00 18.64			7,701.20 88.82			16,590.00 44.49			20.008.14 70.43		28 870 A1 08 02		46,976.78 70.15		79,487.90 84.49	\$472,543.88 58.67
Бизатавата	Administrative	Premiums on Bonds, Commission, etc.	18 89 6	3			:	90 20	8 8								7.805.00	806.00	418.75	711.25	\$0,503.78
		Pension Payments	8170 00	1,095.00	2,460.00		7,115.81	7,701.30	12,080.34	18,173.20	16,590.00	18,115.06	21,205.24	292608.14		28.870.61	40,160.81	45,471.78	54,030.74	78,776.65	\$462,950.10
	926	Per Cent. of Total	8 5	8 8	8 5	}	901	8 5	8 8	9	8	901	00	3 9		3 5	8	91	8	901	100
	Total Receipts	Amount	\$8,916.61	23,276.30	13,196.19		13,814.82	22,768.16	29.261.99	83,962.26	87,290.09	49,972.76	57,222.40	87.887.88		80.203 40	53,447.16	65,536.39	93,004.75	94,085.09	\$806,855.50
		Per Cent. of Total	.81 88.	88.	10.61	2	14.56	9.5	11.91	13.61	16.11	18.86	14.25	26.25	;	22 78	11.64	17.08	18.86	14.98	14.89
81.	Interest	Amount	\$31.86 877.86	1,019.80	1,400.19		1,938.42	2,183.67	8,485.19	4,280.97	5,633.29	6,922 47	8,151.39	8,561.13 9,633.60		8,600.02	6,223.06	11,196.01	12,422.56	14,092.90	\$120,161.98
Racamers	Sity	Per Cent. of Total	99.19 07.68	98.88	80.30 24.30	1	85.44	4 F	88	87.39	8.8	86.15	85.75	8 2 2	,	3 8	91.65	27.	11.11	70.79	72.81
	Indirect City Contributions	Amount	\$3,884.75 15.604.33	22,257.00	11,796.00		11,875.90	20,584.49	26,776.80	29,681.29	81,666.80	43,050.29	49,071.01	15.018.75		15.405.93	32.950.70	40,906.25	66,142.10	96,599.00	\$583,424.65
	, sg o	Per Cent. of Total	:	: :	:	:	:	:			į	:	: :	3 8	1	8 6	28.70	20.20	16.53	14.28	12.80
	Employees' Contributions	Amount	:			:	:	:						12.734.98		14 036 54	14.273.40	13,434.13	14,440.09	13,393.19	\$103,268.87
	į		1894 1804	180	1897	}	1800	9 5	1908	1903	1904	1906	1906	9081	- 8	9 6	1101	1912	1913	1914	Total.

TABLE 58

College of The Crry of New York Rethermer Fond Receipts and Disbursements, 1902-1914 Analyzed by Sources of Income and Object of Expenditure

Disbursements		Payments Disbursements		11,687.39 11,687.39 12,812.37 12,812.37 9,466.54 9,466.54 10,449.84 10,449.84	4,741.25 4,741.25 5,736.36 5,736.36 5,671.71 5,671.71 4,325.00 4,325.00	\$125,896.15
	 				2222	
	ceipta	Per Cent.	100.00 100.00 100.00 100.00	100.00	100.00 100.00 100.00	100.00
	Total Receipts	Amount	\$53,245.83 1,245.89 1,153.57 555.09 25,442.00	480.37 25,344.23 566.81 280.79	10,178.46 123.13 10,100.45 127.14	4.35 \$128,843.76
	at .	Per Cent. of Total	100.00	100.00 1.36 100.00 100.00	1.75 100.00 .99 100.00	4.35
Receipts	Interest	Amount	\$1,245.89 1,163.67 555.09	480.37 344.23 566.81 280.79	178.46 123.13 100.45 127.14	\$5,597.93
	y na	Per Cent. of Total	100.00	98.64	98.25	95.65
	Indirect City Contributions	Amount	\$ 53,245.83	25,000.00	10,000.00	\$123,245.83
	Year		1902 1903 1904 1905	1907 1908 1909 1910	1911 1912 1913 1914	Total

TABLE 59
City of New York Employees' Referencent Fund

Receipts and Disbursements, 1906-1914

	Receipts	Disbursements
Years	Excise Licenses	Pension Payments
1906	\$1,500.00	\$1,500.00
1907	1,500.00	1,500.00
1908	1,575.00	1,575.00
1909	2,225.44	2,225.44
1910	3,208.36	3,208.36
1911	8,253.64	8,253.64
1912	2 5,419.95	25,419.95
1913	20,957.13	30,957.13
1914	96,663.26	96,663.26
Total	\$171,302.78	\$171,302.78

TABLE 60

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Receipts and Disbursements—1911 to 1914

Analyzed by Sources of Income and Objects of Expenditure

		Year	1911	1912	1918	1914	Total
	emente	Per Cent. of Receipts	.78	5.08	33.93	30.30	23.00
Dissurance	Total Disbursements	Amount	\$487.87	17,861.62	115,908.25	166,373.44	\$7,598.51 \$800,630.58
Dissi	Administrative	Expense, Premium on Bonds, etc.	\$187.50	2,279.41	1,811.87	8,819.73	\$7,598.51
		Pension Payments	77.662\$	15,582.21	114,096.38	163,063.71	\$293,032.07
	i i	Per Cent.	100	8	100	100	100
	Total Receipts	Amount	\$62,819.40	853,128.94	841,748.78	549,233.63	\$1,306,930.75
	Interest	Per Cent. of Total	71.	88.	4.28	4.76	8.86
		Amount	\$105.04	2,997.92	14,614.82	26,131.72	843,849.50
	na, eto.	Per Cent. of Total	:	1.41	:	:	.38
RECEIPTS	Donations, Bequesta, etc.	Amount		\$5,000.00	:	4.00	\$5,004.00
	City	Per Cent. of Total	51.40	29.08	3 .	10.71	63.46
	Indirect City Contributions	Amount	\$32,288.81	214,124.99	194,585.57	388,363.85	32.80 \$829,362.72
	eos" Lions	Per Cent. of Total	48.43	87.10	88.78	24.53	·
	Employees' Contributions	Amount	\$30,426.05	131,006.03	132,548.39	134,734.06	otal \$428,714.53
		Year	1161	1912	1918	1914	otal

TABLE 61

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Receipts and Disbursements, 1911 to 1914

Analyzed by Sources of Income and Object of Expenditure

	sements	Per Cent. of Re-	100.00 100.00 67.38 63.81	70.18
Diabursements	Total Disbursements	Amount	\$499.98 4,063.03 6,692.44 10,822.80	\$22,068.25
Diat		Pension Payments	\$499.98 4,063.03 6,692.44 10,822.80	\$22,068.25
	eipta	Per Cent.	100.00 100.00 100.00 100.00	100.00
	Total Receipts	Amount	\$499.98 4,053.03 9,931.83 16,960.72	\$31,445.56
	Interest	Per Cent. of Total	: :88 88:	.25
		Amount	\$27.44 51.36	\$78.80
pts	ity ns for ensions	Per Cent. of Total	100.00 49.35 49.18 37.01	43.45
Receipts	Direct City Contributions for Payment of Pensions	Amount	\$499.98 2,000.00 4,884.12 6,277.42	\$13,661.52
	rect City tributions	Per Cent. of Total	 50.65 18.20 26.80	26.73
	Indirect City Contributions	Amount	\$2,053.03 1,808.32 4,545.38	29.57 \$8,406.73
	yees' utions	Per Cent. of Total	32.34 35.89	
	Employees' Contributions	Amount	1911 1912 1913 \$3 ,211.95 1914 6,086.56	Total \$9,298.51
	Year		1911 1912 1913	Total

TABLE 62
SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Receipts and Disbursements, 1914, Analyzed by Source of Income and Object of Expenditure

	Receipts	Disbursements
Year	Special Revenue Bond Appropriation	Pension Payment
1914	\$900.00	\$900.00

PAY AND PENSION ROLLS

1905 to 1914

COMPARISON OF ACTIVE FORCE AND PENSIONERS

AND OF

PAY AND PENSION ROLLS

Tables 63 to 71

SUMMARY

Pension Fund	Year Fund Es-	P	ropor	tion (s to F	•	ll Du	ring t	he
	tab- lished	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
1. Police Pension Fund			1				ı				
2. Fire Department Relief Fund		11.8	ı	L .					1		1
3. Teachers' Retirement Fund	1		3.7	3.9	3.8	3.9	4.0	4.1	3.8	4.1	4.2
4. Health Department Pension		١.,	۱	۱			ا	۱	١.,	ا	١
Fund	1894	1.6	1.5	2.3	2.3	2.6	2.7	2.8	3.3	3.9	5.9
5. College of the City of N. Y.	1902			9 5	9 2		ء د	١.,	, ,	1.2	١.,
Retirement Fund	1902	0.1	4.0	8.8	3.0	2.4	2.5	1.1	1.3	1.2	0.9
6. City of New York Employees' ("Grady") Retirement Fund	1906							n 132	റ വ	0.07	0.2
7. Department of Street Clean-				l				0.02	0.00	0.01	0.2
ing Relief and Pension Fund		l		l	 		l		0.4	2.4	3.5
8. Supreme Court, First Depart-		ļ	ļ		ļ	l	l	l	"."		0.0
ment, Retirement Fund		l	l	l	l	l	l	0.1	0.6	1.4	1.8
9. Supreme Court, Second De-											
partment, Retirement Fund		ļ	 				 				0.2
Total, All Funds		 						4.1	4.2	4.6	4.8

TABLE 63

POLICE PENSION FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls, 1905-1914

		Total Pensioners	nsioners	Former E	Former Employees	Dependents 8	lents *		Pensions Paid	aid
Year	Strength of Force ¹	Number	Per Cent. of Active Force	Number	Per Cent. of Active Force	Number	Per Cent. of Active Force	Payroll of Active Force	Amount 4	Per Cent. of Active Payroll
165	8,860	2,672	30.16	1,467	16.56	1.205	13.60	\$11,423,000.16	\$1,296,779.87	11.35
1906.	8,874	2,826	31.84	1,610	18.14	1,216	13.70	11,870,201.76	1,342,053.55	11.31
1907	59,462	2,962	31.30	1,768	18.68	1,194	12.62	12,366,862.85	1,497,232.37	12.11
1908.	10,013	3,059	30.55	1,831	18.29	1,228	12.28	12,969,902.12	1,567,584.28	12.09
1909.	10,183	3,217	31.59	1,965	19.30	1,252	12.29	13,416,634.40	1,633,420.53	12.17
1910	10,178	3,393	33.34	2,052	20.16	1,341	13.18	13,938,197.89	1,721,819.84	12.35
1911	10,208	3,711	36.35	2,296	22.49	1,415	13.86	14,189,107.25	1,850,698.12	13.04
1912	10,374	3,903	37.62	2,439	23.51	1,464	14.11	14,442,204.30	2,087,644.28	14.46
1913	10,844	4,201	38.74	2,721	25.00	1,480	13.65	14,702,159.48	2,313,130.88	15.73
1914	10,708	4,234	39.54	2,705	25.28	1,529	14.28	15,205,558.96	2,456,805.13	16.16
						_	=			

* Aggregate amounts paid in salaries to members of the uni-¹ As of December 31. ² One or more children of one family considered as a unit. 'Aggregate amounts paid to pensioners. formed force.

TABLE 64 FIRE DEPARTMENT RELIEF FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls, 1905 to 1914

		To Pensio			rmer ployees	Depe	ndents ²		Pensions P	aid '
Year	Strength of Force ¹	No.	Per Cent. of Active Force	No.	Per Cent. of Active Force	No.	Per Cent. of Active Force	Payroll of Active Force ³	Amount	Per Cent. of Active Payroll
1905	8,565	1,027	28.81	530	14.87	497	13.94	\$4,924,842.19	\$581,547.47	11.81
1906	3,797	1,085	28.57	558	14.69	527	13.88	5,349,959.91	605,478.31	11.32
1907	4,118	1,164	28.26	597	14.49	567	18.77	5,730,377.91	649,031.09	11.33
1908	4,247	1,215	28.60	615	14.48	600	14.12	6,059,228.18	683,938.90	11.29
1909	4,352	1,291	29.66	667	15.33	624	14.34	6,287,506.06	728,822.40	11.59
1910	4,324	1,387	32.08	727	16.81	660	15.27	6,551,379.93	791,798.14	12.09
1911	4,422	1,477	33.40	792	17.91	685	15.49	6,745,219.90	879,975.59	13.05
1912	4,417	1,534	34.73	824	18.65	710	16.08	6,855,800.34	985,702.28	14.38
1918	4,956	1,636	33.01	890	17.96	746	15.05	7,115,802.04	985,727.67	18.85
1914	5,004	1,686	83.69	911	18.21	775	15.48	7,518,200.48	1,058,424.21	14.08

¹ As of December 31st.

^{*} One or more children of one family considered as a unit.

Aggregate amounts paid in salaries to members of the uniformed force.
 Aggregate amounts paid to pensioners.

Sudden increase is due to change in method of payment of pensions to widows and children. The total for 1912 includes approximately \$38,800.00 for such pensions for November and December, 1911. Amounts for 1918 and 1914 are pensions for calendar years.

TABLE 65
TEACHERS' RETIREMENT FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls— 1905 to 1914

		Pens	ioners		Pensions	Paid
Year	Strength of Force ¹	Number ¹	Per Cent. of Active Force	Payroll of Active Force ³	Amount	Per Cent. of Active Payroll
1905	13,888	698	5.03	(*)	\$ 526,502.36	
1906	14,660	805	5.49	\$16,905,442.00	616,984.54	3.65
1907	15,728	909	5.78	17,821,473.00	689,390.64	3.87
1908	16,655	950	5.70	18,941,096.00	724,129.78	3.82
1909	17,244	1,008	5.85	19,848,287.00	777,800.85	3.92
19 10	17,907	1,089	6.08	20,763,093.00	833,863.59	4.02
1911	18,369	1,173	6.39	21,515,845.00	880,389.83	4.09
1912	19,073	1,259	6.60	25,772,997.00	983,554.99	3.82
19 13	19,681	1,515	7.70	27,018,444.00	1,108,874.30	4.10
1914	20,588 2	1,549 5	7.52	28,525,752.00	1,183,397.08	4.15

¹ As stated in the annual report of the Teachers' Retirement Fund for 1913, figures for July 31st of the years indicated.

² Number of participating employees June 30, 1914, as shown by census of municipal service.

³ Estimated on the basis of the 1% deductions from salaries during the calendar years indicated.

[•] The decrease is explained by the extraordinary increase in the payroll for 1912, due to a general raise in salary scales.

As of December 31st.

⁶ Deductions from salaries were made only for part of this year.

TABLE 66

HEALTH DEPARTMENT PENSION FUND

Comparative Growth of Salary and Pension Rolls, 1905-1914

	i i	Total Pe	Total Pensioners 1	Меп	Members	Depe	Dependents	Payroll	Pensions Paid	Paid
Year	Strength of Force ¹	Number	Per Cent. of Active	Number	Per Cent. of Active	Number	Per Cent. of Active	of Active Force	Amount	PerCent. of Active Payroll
1905			2.08	21	1.62	9	94.	\$1,133,323.50	\$18,115.06	1.60
1906	1,742	88	1.66	ឌ	1.26	7	9	1,417,578.004	21,205.24	1.60
1907	1,350	35	2.59	8	1.93	6	98.	1,087,033.70	25,271.78	2.33
1908		41	2.91	33	2.21	6	\$	1,287,910.00	29,698.14	2.31
1909		49	3.45	8	2.74	10	2.	1,369,315.00	35,804.76	3.62
1910	1,441	47	3.26	88	2.50	11	92.	1,442,490.00	38,870.61	2.69
1911	1,337	53	8.8e	3	3.14	11	88.	1,423,976.00	40,160.81	2.83
1912	1,316	\$	4.86	æ	4.03	11	88.	1,400,261.00	45,471.73	3.22
1913	1,326	92	5.73	\$	4.83	21	16.	1,400,423 00	54,030.74	3.86
1914	1,256	26	7.72	3 8	6.77	21	8.	1,330,568.00	78,776.65	26.9
		_			•		_			

4 Taken from annual report of the • Payroll expenditures to May 31st include the entire department; from June 1st to December 31st they are based upon the 1%, as shown in the cash book of the Health Department Pension Fund. • Payroll expenditures for the year based upon 1% de-² In 1905 and 1906 no salary deductions were contributed to the fund, and all employees were eligible to its benefits. Since June, 1907, only such employees as contributed 1% of their salaries to the fund were eligible to its benefits. deductions from salaries, as shown in the cash book of the Health Department Pension Fund. ductions from salaries, as shown in cash book of the Health Department Pension Fund. ¹ As of December 31st. Health Department.

= = : 168

TABLE 67

COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Comparative Growth of Salary and Pension Rolls, 1905–1914

		Pens	ioners	Payroll	Pensions	Paid
Year	Strength of Force ¹	Number	Per Cent. of Active	of Active Force	Amount	Per Cent. of Active Payroll
1905	168	4	2.38	\$270,000.00	\$ 16,330.45	6.05
1906	178	4	2.24	302,000.00	13,540.18	4.48
1907	207	4	1.93	334,121.35	11,687.39	3.50
1908	219	3	1.37	361,411.71	12,812.37	3.54
1909	237	4	1.69	390,857.93	9,466.54	2.42
1910	244	4	1.64	421,438.49	10,449.84	2.48
1911	235	3	1.28	437,991.99	4,741.25	1.08
1912	220	3	1.36	443,839.42	5,736.36	1.29
1913	216	4	1.85	464,998.21	5,671.71	1.22
1914	223	4	1.79	483,963.56	4,325.00	.89

¹ As of December 31st.

TABLE 68

CITY OF NEW YORK EMPLOYEES' ("GRADY") RETIREMENT FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls
1906–1914

		Pensi	oners 2		Pensions	Paid
Year	Strength of Force	Number	Per Cent. of Active Force	Payroll of Active Force	Amount	Per Cent. of Active Payroll
1906		1			\$1,500.00	
1907		1			1,500.00	::::
1908		2			1,575.00	
1909		2			2,225.44	l
1910		4			3,208.36	
1911		11		\$44,876,990.18°	8,253.64	.02
1912		28		44,336,911.79	25,419.95	.06
1913		63		45,335,695.16	30,957.13	.07
1914	32,856 ¹	166	.51	46,225,613.99	96,663.26	.21

¹ As of June 30, 1914.

² As of December 31, 1914.

³ Includes Department of Street Cleaning, as no employee covered by the provisions of that fund was pensioned in 1911.

TABLE 69

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls, 1911 to 1914

		Total Per	Total Pensioners 1	Former Employees	mployees	Dependents 3	lents 3		Pensions Paid	Paid 4
789.X	Strength of Force ¹	Number	Per Cent. of Active Force	Number	Per Cent. of Active N	umber	Per Cent. of Active Force	Payroll of of Active Force	Amount	Per Cent. Active Payroll
1912. 1912. 1913.	5,292 5,464 5,474	356 484	6.51 8.84	76 281 347	1.42 5.14 6.34	10 • 21 75 137		\$4,086,257.62 4,666,556.19 4,667,298.06	\$299.77 \$15,582.21 114,096.38 163,053.71	: 2.6 : 8.4.6

¹ As of December 31st. ² One or more children of one family considered as a unit. ³ Aggregate amounts paid in salaries to members participating in the fund. ⁴ Aggregate amounts paid to pensioners. In accordance with law, no actual payments were made until January, 1913. ⁵ Nine widows and one widowed mother were pensioned to take effect between September 10th and December 31st, 1911.

TABLE 70
SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Comparative Growth of Active Force and Pensioners and of Salary and Pension Rolls, 1911-1914

	Strength	Pensio	oners 1	Payroll of	Pensions	Paid
Year	of Force ¹	Number	Per Cent. of Active Force	Active Force	Amount	Per Cent. of Active Payroll
1911 1912 1913 1914	263 289 233 295	1 5 8 11	.38 1.73 3.43 3.73	\$595,143.54 659,175.22 496,856.30 608,656.00	\$499.98 4,053.03 6,692.44 10,822.80	.08 .61 1.35 1.78

¹ As of December 31st.

TABLE 71

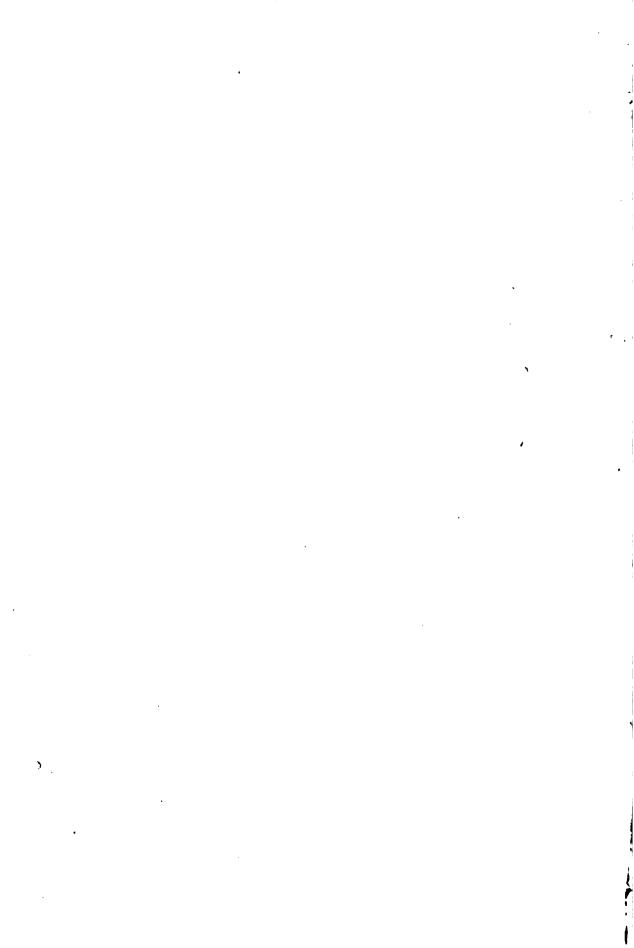
SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

Comparison of Active Force and Pensioner and of Salary and Pension Rolls, 1914

	94	Pensi	oners 1	Down No.	Pensions	Paid
Year	Strength of Force ¹	Number	Per Cent. of Active Force	Payroll of Active Force	Amount	Per Cent. of Active Payroll
1914	177	1	.56	\$399,448.91 2	\$900.00	.23

¹ As of December 31st.

² Amount includes appropriation for fiscal year ending September 30, 1914, for 33 employees whose salaries are paid partly by the city.



REPORT ON THE PENSION FUNDS

OF THE

CITY OF NEW YORK

PART II

AN ACTUARIAL INVESTIGATION

OF THE

MORTALITY AND SERVICE EXPERIENCE

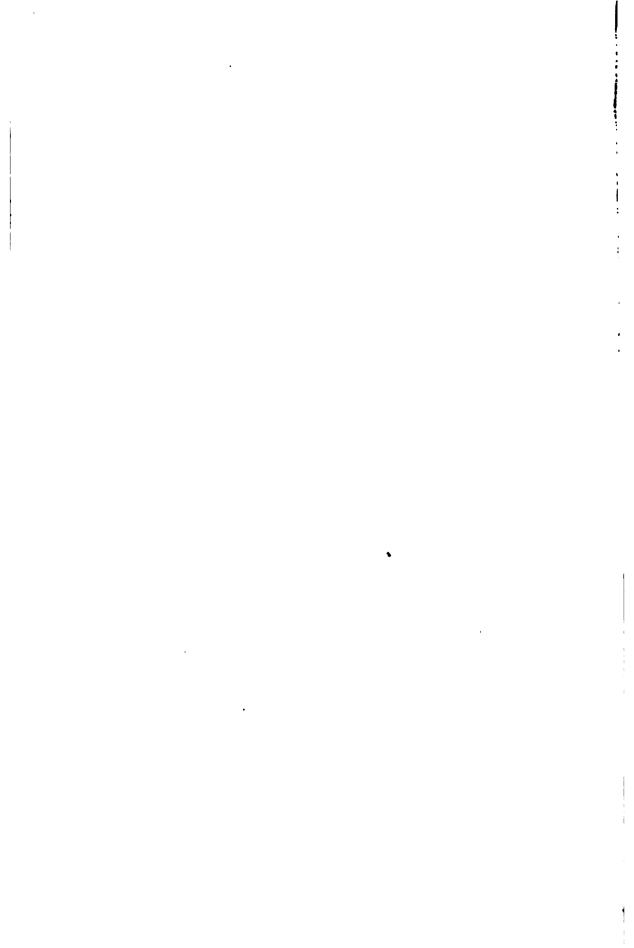
OF THE

SPECIAL AND GENERAL SERVICE FUNDS

FOR

MUNICIPAL EMPLOYEES

COMMISSION ON PENSIONS
City of New York
1916



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REPORT ON THE PENSION FUNDS

OF THE

CITY OF NEW YORK

PART II

AN ACTUARIAL INVESTIGATION

OF THE

MORTALITY AND SERVICE EXPERIENCE

OF THE

SPECIAL AND GENERAL SERVICE FUNDS

FOR

MUNICIPAL EMPLOYEES

INCLUDING

Tables and Diagrams on Family History and a Valuation of Assets and Liabilities

COMMISSION ON PENSIONS
City of New York
1916





To the Commission on Pensions, City of New York.

SIRS:

The following report contains the fundamental facts which are indispensable to the intelligent consideration of the city's existing pension plans, and upon which alone a sound, properly organized new pension system can be constructed. It represents the results of a complete actuarial investigation of the nine existing pension systems of the city of New York, and furnishes the first comprehensive data ever available with reference to these funds.

In previous reports it has been made clear that the present pension plans, which have involved already a disbursement of nearly \$57,000,000, and which now entail an expenditure of over \$5,000,000 a year, were put into operation wholly without forecast or intelligent thought of the future cost which the commitments assumed would involve.

When the Pension Commission was requested by Mayor Gaynor, and subsequently by Mayor Mitchel, to study and present plans for the reorganization of the funds, it found it impossible to consider its problem intelligently because of the total lack of facts. It was necessary to obtain the facts, and as a first step in this effort, to devise a method for ascertaining what the prospective cost of existing plans would be. This cost can be obtained only through an actuarial analysis of the essential elements of the pension problem. These are fully discussed in the report which broadly covers the service and mortality experience of the employees to whom the pension funds relate, the amounts of such pensions, and the average life and resulting total disbursement to prospective pensioners.

Since experience is the only basis on which a sound fund can be constructed, it was necessary to analyze the experience of the city of New York for a sufficient period to lay the foundation for sound conclusions. A six-year period was selected extending from 1908 to 1914 inclusive. Every employee on the rolls of the city of New York at that time was taken into consideration for each of the years in question. The salaries, number of employees, length of service, withdrawals through death, resignation or removal, the age of employees, provisions underlying the different pension plans with respect to maturity of pension rights, and the amount of pension, all were taken into consideration.

The statistical analysis has required more than two years' work, and is unparalleled in its scope by any similar study of a body of employees ever made anywhere in the world. In formulating the plan of investigation, the experience of insurance companies in dealing with actuarial problems was drawn upon, and the advice of the Actuarial Society of America obtained. This Society appointed a consulting board of actuaries consisting

of Messrs. William A. Hutcheson, Robert Henderson and Henry Moir, Actuaries of the Mutual Life Insurance Company, the Equitable Life Assurance Society and the Home Life Insurance Company respectively, who have aided the Commission most generously by expert advice and counsel. The experience of European countries, notably England, where pension systems have been long in operation and are now rapidly undergoing reorganization on the basis of similar investigations, was heavily drawn upon for guidance in the studies made by the Commission. The work was put in the direct charge of Mr. George B. Buck, an actuary with special training in pension problems, and a special staff was recruited for the detail statistical and mathematical analysis. This staff was from time to time supplemented by assistance loaned by the Commissioner of Accounts and by the advisory assistance of the Bureau of Census of the Department of Education.

It is not necessary to summarize the results of this study which are fully set forth in the report in easily intelligible form, except to say that the computations show that the present liability of the existing pension funds, on the basis of existing laws and the past experience, for present and prospective pensioners aggregates the stupendous total of \$215,520,413. Against this charge there are funds in hand aggregating \$3,849,653 and prospective receipts from the contributions of employees where such contributions are required, of \$8,895,192, leaving a deficit of \$202,775,568 to be met by the city by way of indirect contribution and out of appropriations from tax levy funds.

As shown in Part I of the final report of the Commission, which has been previously published, there are many considerations which make it undesirable for the city to continue the present pension plans by reason of their inequity and failure to make suitable provision for the retirement of employees under proper conditions, and their lack of conformance with standards of efficient management. If this were not so, the financial burden which they will enforce on the city demands a revision of existing pension systems on a basis which would in part relieve taxpayers of excessive charges, and what is perhaps more important, would provide for the accumulation of reserves now wholly lacking against the increased annual charges for pension purposes. The city, in its pension systems, has blindly, perhaps unwittingly, embarked upon a vast financial program with no thought of the cost involved or the methods of financing this cost.

In its subsequent recommendations the Pension Commission will deal concretely with pensions for each class of employees and methods for financing them. It recognizes that radical changes, with reference to existing employees, may not be feasible in those funds which are now established by law. It will, however, submit proposals for radical reorganization with respect at least to future entrants into the service. Such proposals will be carefully considered, before submission, in the light of the finances of the city, the general employment problems of the city and the rights and viewpoint of the employees themselves.

In submitting this report the Commission desires to express its appreciation of the efficient work of its actuarial staff, and acknowledges with thanks the very helpful co-operation afforded it by other branches of the government in the performance of its work. It is especially grateful to the

Actuarial Society of America and to the special advisory board of actuaries for their generous and continuous assistance, all of which has been rendered voluntarily and without cost to the city.

Respectfully submitted,

HENRY BRUÈRE, Vice-Chairman and Secretary.

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ACKNOWLEDGMENT

The preparation of this report has necessarily involved an enormous amount of actuarial and statistical work. The undertaking has extended over a period of nearly two years, in which time many problems have been encountered which required in their solution the exercise of discretion and forethought. In these matters the author has had the counsel of William A. Hutcheson, Actuary of the Mutual Life Insurance Company, Robert Henderson, Actuary of the Equitable Life Assurance Society, and Henry Moir, Actuary of the Home Life Insurance Company, who constitute the Advisory Committee of the Actuarial Society of America. These gentlemen have been most generous in giving valuable time to the consideration and approval of the general methods used in the work, and to them the author wishes to express his gratitude.

Acknowledgment is due to John S. Thompson, Actuary, for suggestions and criticisms, and Lewis Meriam, Statistician, for editorial criticisms and suggestions on the report as a whole and for special assistance in the preparation of the introduction. To them and to Margaret A. Burt and other members of the Commission's staff the author desires to express appreciation.

GEORGE B. BUCK.

New York, May 8, 1916.

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INTRODUCTION

Three principal objects have been sought in the actuarial investigation of the pension funds of the City of New York: (1) to determine the exact financial condition of each fund as it was on the date of the examination; (2) to determine the minimum rates of contribution which a new fund just starting would have to collect, either from the city or the employee or from the two combined, in behalf of each new entrant in order to maintain the fund in a constant state of solvency, and (3) to provide a basis for calculating the financial effect on the fund of any increases or decreases in the extent of the pension provisions now in force, or of any new provisions which may be introduced in the event of reorganization.

Forecasting the future—Determining the financial condition of a pension fund is by no means the same problem as determining the immediate financial condition of an individual. The solvency of an individual can commonly be demonstrated by showing that what he has exceeds what he owes at the moment. The calculations relate almost entirely, if not entirely, to the present. In determining the financial condition of a pension system, the calculations relate very largely to the future, and in certain instances to the somewhat distant future. The moment an employee enters the city service the pension system becomes liable to pay him certain pension benefits provided certain things happen to him and provided he himself fulfills certain conditions. The amount of the liability thus incurred depends on the probability that these contingencies will happen and the probability that the employee will fulfill the conditions. Similarly the pension system has certain sources of revenue, such as contributions by the city, contributions by the employee, and, what is very important, interest earned by accumulated funds. The assets which are to be available to pay the pensions now being earned when they fall due after several years' service will depend in part on the revenue to be secured from these sources in The financial condition of a pension fund can therefore be the future. determined only by forecasting the future.

The actuary, in forecasting the future, does not depend on any peculiar or occult powers, but relies on three distinct processes. First, by analyzing the legal provisions of the pension fund and the practice under those provisions, he determines what the factors or forces are that affect the financial condition of the fund. Second, through a thorough and painstaking census of all the employees and pensioners, and through a careful examination of many city records, he collects a great body of data, which, when properly tabulated, reveal exactly how these forces have operated in the past. Third, on the assumption that these factors or forces will continue to operate in the future essentially as they have in the past he prepares rates of operation for the future based on the rates for the past.

Important forces determining pension costs—Five of the factors or forces which have to be considered in valuing the fund, as the process

is technically called, are of special importance. First, perhaps, is the rate of mortality among employees in the active service, which is needed to forecast how many of those now on the rolls will die before reaching the pension age or fulfilling the pension conditions. Second, is the rate of withdrawal, to show how many of those in the active service will leave it by voluntary resignation or by dismissal without drawing a pension. Third, is the rate of retirement on pension, to show how fast and at what ages and service periods the employees will avail themselves of the pension privilege. Where pensions are paid for disability as well as for length of service this rate is divided to distinguish between those who leave the service because they are disabled and those who leave because they have fulfilled the service requirements and prefer to retire. Fourth, is the rate of mortality among pensioners, required so that the actuary may estimate the amounts which will be paid before the pension lapses on the death of the pensioner. This rate has to be divided to distinguish between disability pensioners and service pensioners, because it cannot be assumed that persons who have had to retire on account of sickness or service accidents will live as long as those who retire merely because they have fulfilled the conditions and desire to retire. Fifth, when the benefit bears a fixed relationship to salary, a salary scale of employees is prepared to show the probable future movement of salaries as anticipated from the experience of the past. Sometimes funds contain provisions for benefits to widows and children, as in the New York City police and fire funds, and then other and more elaborate compilations have to be made; and always the rate of interest must be considered.

Interest-The rate of interest is, of course, of great importance in forecasting the future of a financial system providing for regular contributions to meet obligations to mature in the future, because the money received earns interest until it is paid out. The effect of interest is occasionally underestimated or lost sight of in offhand discussions of the pension problem. A dollar invested at four per cent. has earned practically another dollar by the end of seventeen years, and hence, roughly speaking, a dollar paid to the pension fund to-day will, at four per cent., pay for two dollars' worth of benefits at the end of about seventeen years, and for four dollars' worth at the end of thirty-five years. Similarly a dollar paid as a pension contribution in the first year of an employee's service is worth twice as much as a dollar paid in the eighteenth year of service and four times as much as a dollar paid in the thirty-sixth year. In valuing a fund, therefore, the actuary must make full allowance for the earning power of the money which will remain in the fund for any time between its receipt as a contribution and its payment as a benefit.

The present value—To make proper allowance for the difference between a dollar in hand and a dollar to be received in the future, and the difference between a dollar due to be paid to-day and a dollar due to be paid in the future, the actuary has to determine what a dollar to be received into the fund at a certain time in the future would be worth if in hand to-day and similarly what amount if in hand to-day would, with the interest it would gain, pay a debt of a dollar due at a certain time in the future. In

technical language he calculates the present value of all future assests and the present value of all future liabilities.

The actuarial balance sheet—The present report discusses in detail the precise methods followed in making the actuarial valuations of the numerous pension funds of New York City; methods which have, of course, been outlined only in a very general way in the preceding paragraphs. The result of these actuarial valuations is the actuarial balance sheet. For each of the separate funds a balance sheet is given in the section of the report dealing with that fund, and finally for all funds combined a single balance sheet is given. This combined balance sheet is reproduced on pages 4 and 5.

The pension deficit—This combined balance sheet shows that the present value of the benefits to be paid those who are already on pension is \$48,119,976; and the present value of benefits to prospective pensioners among those now in the active service and the dependents of employees now in service is \$167,400,437. The grand total present liability for the benefits under the system is \$215,520,413. Against this liability can be set \$3,849,653 of funds in hand, and \$8,895,192, the present value of the future contributions of present employees. The deficit, in other words, the amount by which the present value of the obligations exceed the present value of all resources is \$202,775,568.

The contribution rates—The second part of the actuary's work which is of prime importance is the development of the rates of contribution which a new fund, just starting but paying the same benefits as the plan now in operation, would have to charge on account of new entrants, if the fund is to be maintained in a constant state of solvency. These rates can be likened in some ways to the premium rates of insurance companies but it must be remembered that the rates here given include no contributions toward the expenses of administering the work and no profits. They are minimum cost figures. They are annual premiums expressed as percentages of salary; or, in other words, they show the number of cents which would have to be charged each year per dollar of salary paid to an entrant of the specified class, to provide the pension promised under the law. No matter who pays the premium, the employer, the employee, or the two combined, these rates of contribution or rates of cost remain the same.

The determining forces—A great complexity of interacting forces, and not any single force, determine what this rate of contribution must be in a given instance. Among these forces are the ones previously mentioned as those which the actuary has to forecast for the future on the basis of the experience of the past, such as the rate of mortality in the active service and among pensioners, the rate of withdrawal by resignation or dismissal, the rate of retirement as disability and service pensions and the probability of salary increases. The rate of interest is of course of great importance. Certain other forces are largely determined by the law itself and others by the sex, age and occupation of the employee.

A VALUATION OF ASSETS AND LIABILITIES

Valued as of

	valued as of
Liabilities	
. Item	Present Value of Payments to be Made
Pensions to Employees now on the Pension Rolls of the funds:	
Police Pension Fund	\$18,785,176
Fire Department Relief Fund	7,245,897
Teachers' Retirement Fund-Men	722,460
Teachers' Retirement Fund—Women	10,858,750
Health Department Pension Fund—Men Health Department Pension Fund—Women	872,430
Health Department Pension Fund—Women	21,428
College of the City of New York Retirement Fund	24,152
City of New York Employees' Retirement Fund—Clerks City of New York Employees' Retirement Fund—Mechanics	299,593
City of New York Employees' Retirement Fund—Mechanics	143,008
Department of Street Cleaning Relief and Pension Fund	716,696
Supreme Court, First Department, Retirement Fund	58,720
Supreme Court, Second Department, Retirement Fund	4,357
Pensions to Dependents now on the Pension Roll:	7,557
Police Pension Fund	5,021,433
Fire Department Relief Fund	2,903,009
Health Department Pension Fund—Men Health Department Pension Fund—Women	2,036
Health Department Pension Fund-Women	40,984
Department of Street Cleaning Relief and Pension Fund	285,042
Total Pensions Entered Upon	\$48,119,976
Pensions to Employees now in Active Service:	
Police Pension Fund	\$40,206,284
Fire Department Relief Fund	24,928,118
Teachers' Retirement Fund—Men Teachers' Retirement Fund—Women	7,322,100
Teachers' Retirement Fund—Women	50,906,450
Health Department Pension Fund—Men	1,521,199
Health Department Pension Fund—Women	403,681
College of the City of New York Retirement Fund	480,067
City of New York Employees' Retirement Fund—Clerks City of New York Employees' Retirement Fund—Mechanics	6,928,545
City of New York Employees' Retirement Fund—Laborers	3,093,457 1,683,344
Department of Street Cleaning Relief and Pension Fund	4,197,675
Supreme Court, First Department, Retirement Fund	879,143
Supreme Court, Second Department, Retirement Fund	259,275
Pensions to Dependents of Employees now in Active Service and of Pen-	-391-73
sioners now on Pension Roll:	
Police Pension Fund	14,253,522
Fire Department Relief Fund	6,496,898
Health Department Pension Fund—Men	28,167
Health Department Pension Fund—Women	1,755
Department of Street Cleaning Relief and Pension Fund	3,810,757
Total Pensions Not Entered Upon	\$167,400,437
Grand Total	\$215,520,413

OF THE COMBINED PENSION FUNDS

June 30, 1914

Assets	
Item	Present Value of Payments to be Received
Funds in Hand:	
Police Pension Fund	\$936,650
Fire Department Relief Fund	850,446
Teachers' Retirement Fund—Men	174,590
Teachers' Retirement Fund-Women	708,125
Health Department Pension Fund—Men	248,819
Health Department Pension Fund—Women	
College of the City of New York Retirement Fund	
City of New York Employees' Retirement Fund-Clerks	
City of New York Employees' Retirement Fund-Mechanics	
City of New York Employees' Retirement Fund-Laborers	
Department of Street Cleaning Relief and Pension Fund	
Supreme Court, First Department, Retirement Fund	5,974
Supreme Court, Second Department, Retirement Fund	
Total Funds in Hand	\$3,849,653
Contributions by Employees:	
Police Pension Fund	\$3,206,594
Teachers' Retirement Fund-Men	1,000,125
Teachers' Retirement Fund—Women	3,183,600
Health Department Pension Fund—Men	86,222
Health Department Pension Fund—Women	28,942
Department of Street Cleaning Relief and Pension Fund	1,316,533
Supreme Court, First Department, Retirement Fund	73,176
Total Contributions by Employees	\$8,895,192
Deficiency:	
Police Pension Fund	
Fire Department Relief Fund	
Teachers' Retirement Fund—Men. Teachers' Retirement Fund—Women	6,944,335
Health Department Parsies Fund Men	57,798,985
Health Department Pension Fund—Men	1,834,852
College of the City of New York Retirement Fund	611,617
City of New York Employees' Detirement Fund	499,165
City of New York Employees' Retirement Fund—Clerks City of New York Employees' Retirement Fund—Mechanics	7,228,138
City of New York Employees' Retirement Fund—Mechanics City of New York Employees' Retirement Fund—Laborers	3,236,465
Department of Street Cleaning Relief and Pension Fund	1,798,149 6,854,870
Supreme Court, First Department, Retirement Fund	858,713
Supreme Court, First Department, Retirement Fund Supreme Court, Second Department, Retirement Fund	263,632
Total Deficiency	\$202,775,568
Grand Total	\$215,520,413

Among the forces governed largely by the provisions of the pension law itself are the character of the benefits allowed under the system, the conditions upon which they are granted, their amount, and the administrative provisions introduced to protect the system from abuse. Obviously a system that provides a benefit only in the event of old age will, other things being equal, cost far less than one providing not only a superannuation benefit, but also a benefit on disability and a return of contributions in event of resignation or dismissal. Similarly one which does not permit retirement until an advanced age after a considerable period of service will cost far less than one allowing the same benefit but not requiring that the employee should have reached so high an age or shall have served so long a minimum period. The larger the amount of benefits under a given system the larger is the cost. When disability benefits are granted, the administration becomes highly important, because lax administration means that many who are not really disabled will get on the disability pensioners' roll and draw pensions for a long period. Differences between different funds in respect to these forces will cause great differences in pension costs or contribution rates.

Effect of sex—The sex of the employee is an important factor, giving rise as it does to various physiological, psychological, and economic differences. Exactly why women live longer than men is not fully known but that they do is apparent from the mortality rates, and necessitates that for equal benefits women be charged more than men, because they will live longer to enjoy them and on the average will receive more payments. Psychological and economic differences lead to a difference in the retirement rates, and these differences necessitate a variation in the premium. Whenever the fund to be valued has a large body of women employees and a large body of men, the actuary finds it necessary to distinguish the two sexes throughout.

Effect of age—That the age of the entrant is an essential factor is of course apparent. The young entrant will make many payments into the fund or will cause them to be paid in his behalf. They will draw interest over a long period of years. The old entrant will make few payments and the interest his payments will earn will be comparatively small. Other differences between the young entrant and the older entrant exist, affecting the probability of their living to the pension age. In any equitable scheme requiring employees to contribute and in any scientific scheme financed wholly by the employer, differences in the cost for different ages have to be recognized.

Many rates required—Separate rates then must be worked for each fund and where many men and women are employed the rates for the two sexes must be prepared separately and a similar course must be followed where the fund is composed of large distinct groups. For each fund or division of a fund a separate rate has to be prepared for each probable entrance age. Such rates for each fund or a division of a fund are presented in the sections of the report dealing with it and are discussed in detail. For the purposes of comparison of the cost of the benefits under the

different funds and divisions of the fund a table has been prepared showing for each fund the cost of each benefit granted under it for a person entering it at what is the average age of entrance as shown by the past experience. This table may be regarded as showing the average cost of each benefit under each fund. The table is reproduced below.

RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES FOR THE AVERAGE AGE AT ENTRANCE INTO EACH FUND

All Funds	Func	k
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	Total	PENSION TO	EMPLOYEES	Pension	Pension	Pension to De-
FUND OR CLASS	All Pensions	Service Pensions	Disability Pensions	to Widows	to Children	pendent Parents
Fire Department Relief Fund Police Pension Fund Department of Street Cleaning	14.99	11.17	3·47 9.02	4.62 3.62	.25 .14	.22
Relief and Pension Fund Health Department Pension	8.55	.61	3.41	4.12	.15	. 26
Fund—Men Teachers' Retirement Fund—	7.36	5.81	.87	. 58	.04	.06
Women	7.17	5 - 95	1.22	• • • •		•••
Fund—WomenSupreme Court First Depart-	6.89	5.92	.91	• • •	• • • •	.06
ment, Retirement Fund Teachers' Retirement Fund—	4.64	4.42	.22	• • •		• • •
MenSupreme Court, Second Depart-	4.13	3.69	-44	•••		•••
ment, Retirement Fund College of the City of New York	3.46	3.46		•••	• • • •	•••
Retirement Fund	3.40	3.40		•••	• • •	•••
Retirement Fund—Mechanics City of New York Employees'	1.43	1.43		•••	• • • •	•••
Retirement Fund—Clerks City of New York Employees'	1.16	1.16	• • • •	•••	•••	•••
Retirement Fund—Laborers.	.80	.80		• • •		• • • •
Average Fund	7.14	3 · 57	2.30	1.18	.05	.04

Cost of benefits—The cost of all benefits under the retirement system varies from an annual premium of 19.73 cents in each dollar of salary in the case of members of the Fire Department Relief Fund to one of 0.80 cents in the case of the laborers in the City of New York Employees' Retirement Fund. The laborers, it will be noted, receive only a service pension and this, by the way, is awarded only in case the employee is also disabled, whereas the firemen receive a service pension costing 11.17 cents in the dollar of salary; a disability pension costing 3.47 cents, a pension to widows costing 4.62 cents, one to children costing 0.25 cents, and one to dependent parents costing 0.22 cents. Next to the firemen in total cost of all benefits come the members of the Police Pension Fund, with a pension that costs 14.99, and providing for all classes of benefits. The other funds, it will be noted, are arranged in the tables in the descending order according to the total cost of the benefits provided.

That gross inequalities exist in the value of the pension benefits as be-

tween different branches of the city service is indicated by the differences in the contribution rates. Such inequalities are not surprising when it is remembered that each system now in existence was developed independently, on a sort of hit and miss plan, with little or no regard to what had been done, or what was to be done, for other classes of city employees. That peculiar conditions of service demand special pension benefits is of course generally recognized, but that men engaged in similar types of work should receive different benefits merely because they happen to be attached to different branches of the service emphasizes the need of reorganization.

Reorganization imperative—Reorganization will have to come, whether it attempts to remedy such inequalities or not, for the actuarial balance sheets for the separate funds all show liabilities greatly in excess of assets. The time is rapidly approaching when the funds will no longer be able to pay the pension claims as they come due. The teachers' fund reached this stage while the present report was in preparation. Now it is not able to pay the teachers who have already retired, and for over a year it has not been able to retire any additional teachers no matter how great the need. The Health Department Fund will soon be in exactly the same condition. Reorganization there, too, is imperative.

Data for scientific reorganization—The greatest value of the present investigation is that it furnishes, for the first time, the data needed to reorganize these funds on a sound basis. By the expenditure of an immense amount of labor, the forces which determine pension costs in the different branches of the service have been measured and the measurements are applicable to the service for a good many years to come. The pension provisions may be continued as they are with new sources of income, or they may be changed; the employees may contribute to the funds in large amounts or they may not contribute at all; benefits may be increased or decreased; pensions may be based on salary or they may be flat sums independent of salary; but whatever the plans proposed the rates of action of the fundamental forces that determine the cost are now known and are contained in the basic tables of the present report. These tables are to the pension fund what the standard mortality tables are to insurance companies. Their use is not limited to a single plan, for they contain the data essential to determine the cost of any plan.

Cost a determining factor—Many specific pension schemes and pension provisions will undoubtedly be suggested by representatives of the employees and of the city government in the effort to reach an agreement as to what is the best system for a particular service or for a particular group of employees. A determining factor in this consideration will be that of cost; that is, whether the employees and the city can afford a benefit which in other ways seems highly desirable. Just as the basic tables of the report furnished the means of determining mathematically the rates of contribution which would be required from the city or the employee or the two combined to maintain the present fund in a solvent condition, so they furnish the means of determining the rates for any other system. If the rates are found sufficiently low to make the scheme come within the range of possi-

bility then an actuarial balance sheet for the proposed systems can be prepared to show the extent of the liability which will be incurred under it for those already in the service. In this way the present report will probably develop its greatest usefulness.

The sections of the report—The report is divided into four sections or parts. The first deals with the general methods employed in collecting the basic data and arranging it in the form required for the valuation; the second, with the nine separate pension funds considered and such special methods as were used for them; the third, with the basic data and the methods followed in valuing pension funds to widows and children. The fourth section brings together all the statistics necessary for the proper consideration of the pension systems of the City of New York as a single unit so arranged as to facilitate comparison between the different funds.



SECTION I

GENERAL DESCRIPTION OF DATA AND METHODS USED



DATA USED AS BASIS FOR VALUATIONS

The mortality and service experience of the city employee during the period from June 30, 1908, until June 30, 1914, was used as the basic data for the present valuation. The required information regarding this experience was secured in part directly from the employees and in part from the records of the various departments. In few cases were the records arranged in a way that in the least facilitated the work of the Commission and rarely did they contain the information necessary for a scientific administration of a pension fund. However, through various combinations of the records of the departments, the records of the Civil Service Commission, the files of the City Record, the vital statistics registration in the Board of Health, and the payrolls on file in the Hall of Records, the Commission was able to accomplish what had at first seemed an almost impossible task.

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COLLECTION OF SCHEDULES

The required information regarding persons in the active service on June 30, 1914, was secured directly from the employees themselves, by means of schedules which called for such data as would be sufficient to value the benefits under any provision of the pension laws in force on that date. In distributing these cards to the employees and in collecting them after they had been filled out, the Commission was assisted in each department by representatives appointed to co-operate in the undertaking by the respective offices and bureaus. All schedules, after being prepared by the employees, were reviewed by the employee's superior officer before being forwarded to the office of the Commission. On page 13 is a copy of the schedule employed.

Schedules of distinctive colors, calling for slightly different information, were prepared (1) for employees who had left the active service without pension during the six-year period; (2) for pensioners on the rolls on June 30, 1914, and (3) for those whose pensions had terminated in the preceding six years. These schedules were prepared by employees of the Commission on Pensions from the records in the departments.

Although data for the period from June 30, 1908, to June 30, 1914, were to be used as a basis for the tables showing the mortality and service experience of the force, records were secured for the period from December 31, 1907, to the date of the actual collection of the facts. By thus having the period for which the employees supplied data overlap, at either end, the period for which information was absolutely essential, the necessity for absolute precision as to the limiting dates on the part of the employees and field workers was eliminated. Data regarding facts not relating to the basic period were easily rejected in the office by mechanical methods and a precision as to time limits secured that would scarcely have been feasible had dependence been placed solely upon the many employees and the field workers who naturally could not be conversant with all the requirements of the census.

CHECKING OF SCHEDULES AS TO NUMBER AND COM-PLETENESS

To make sure that schedules had been secured for all employees each department was requested to furnish the Commission with a statement showing the number of employees on the payroll in the various bureaus and divisions of the department as of June 30, 1914. The schedules received by the Commission were checked as to this number to make sure that no schedules for active employees were omitted. After the cards for the active service were thus checked the out of service cards were added and later, by means of tabulating machines, the cards were assorted so as to show the active service as of December 31, 1907, and as of June 30, 1914. The tables prepared from these assortments were again checked against the records of the department. This check was for the purpose of insuring that no cards for persons out of service had been omitted. The same methods were employed in checking cards for pensioners.

In the active service schedule shown on page 13 will be noted a

small coupon which contains the name of the employee and certain other facts. Similar coupons were attached to the schedules for the out of service employees and the pensioners. After the schedules for all departments in the city government had been received, these coupons were detached and arranged alphabetically. By this method all duplicate schedules were located and the cases of employees who had passed from one department of the service to another during the six-year period of the experience were discovered. Duplicates were of course removed, and where an employee had served in more than one department the records were adjusted, so that reports for such persons would tabulate consistently with those for persons who had been employed in but one service. Some idea of the volume of work incidental to this alphabetical assortment may be conveyed by the fact that 24,825 schedules were found, in which similarity of names were involved and these of course had to be examined for possible duplicates.

METHOD OF CORRECTING DEFECTIVE SCHEDULES

While little difficulty was experienced in obtaining the cards for persons in active service, it was sometimes impossible to obtain all the necessary data regarding persons who had left the service. In several departments all the information required regarding out of service employees was available with the exception of the employee's date of birth. In such case the cards were brought to the office of the Commission, assorted alphabetically and then taken to the Civil Service Commission where the employee's date of birth was generally secured from the records regarding his appointment. In a few cases, especially where the employee had been in the service for a very long period of time, the Civil Service Commission did not have a record of the date of birth. This difficulty arose frequently in the cases of persons who had died. In such instances the records were taken to the Health Department where search was made in the records to see if the employee had been born, had married or had died in New York City. If so the date of birth was secured from this source.

By these general methods the major portion of the desired information was secured. In fact 93% of all the cards were complete. The remaining 7% lacked generally the answer to but a single inquiry; in few cases were two or more inquires unanswered, in fact in so few that such cases are practically negligible.

To permit the use of the small number of incomplete schedules in combination with the complete, the missing information was supplied by the Commission on the assumption that the distribution of the incomplete schedules according to the unknown facts would be the same as the corresponding distribution of the complete schedules. A method was devised whereby the incomplete cards for one department were corrected from the complete reports relating to that department only, and both the active service and the out of service cards for the department were used as a basis for the correction. The method was tested by selecting at random perfect cards containing complete data secured exclusively from the records, tabulating the information given on them, and then comparing the resulting

16 SECTION I

figures with those used as a basis for correcting the incomplete cards. The two sets of figures were so nearly identical that it is believed no appreciable error has been introduced into the work by the failure to secure complete data regarding a few individuals. The method made possible the use of such information regarding these people as was actually secured from the records and, what is far more important, has permitted the use of many complete schedules which could not have been used as the basis for experience tables had the few incomplete reports which related almost exclusively to out of service persons been excluded. Schedules for active employees in any department or division could not be included in the basis for the experience tables unless all the corresponding schedules for out of service employees for the same department or division could be made.

PREPARATION OF PUNCH CARDS FOR MECHANICAL TABULATION

For purposes of the tabulation the data on the schedules were transferred to punch cards by means of a system of code numbers. On pages 17 and 18 are copies of the cards used.

After the data were transferred to the punch cards, the cards were verified by reading the information punched into them back to the original schedule. In the latter part of the investigation this verification was performed by the use of a mechanical checker, devised by the Commission and built by the Hollerith Tabulating Machine Company.

MECHANICAL TABULATIONS MADE

After the cards were punched and verified they were tabulated mechanically by means of Hollerith tabulating machines. The code numbers employed in punching were arranged so that each card in any group to be tabulated had at least one hole that was common to all the other cards in that group and thus it was possible to check the sorting of the cards by groups practically instantaneously, and of course so far as possible each group was kept by itself in passing the cards through the machines. When combinations were required in the tabulation, work sheets were employed which showed in detail the figures for each of the groups that had to be combined to give the required results. In addition to facilitating tabulation these sheets served a further useful purpose in providing a check on the totals used, for it was possible to determine that the experience of each of the component groups of a combination was in harmony with the experience of the combination as a whole, thereby preventing the inclusion of a group with others which had a distinctly different experience.

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TABULATION OF MORTALITY AND SERVICE ACTUAL EXPERIENCE TABLES

The active service

A tabulation showing the experience of the active service during the last six years was necessary to measure the forces on which the costs of pensions depend. In this tabulation separate tables had to be prepared for the different classes of city employees which must be distinguished either because of differences in the pension legislation applying to them or because of peculiarities affecting the experience. The following tabular statements show the final form of these tables and give the total of the detail on the sheet; the tables are not presented in their entirety on account of lack of space. Attention is called to the fact that in certain departments select experience tables were developed and in these cases the data were tabulated in a somewhat different form, but for the purposes of the following summary statement the select and ultimate experience have been consolidated.

TABLE 1—SUMMARY OF ACTUAL EXPERIENCE—ACTIVE SERVICE—ALL FUNDS

Fund or Class	Sur- vivors	En- trants	With- drawals	Deaths	Separa- tions by Disability	Service Retire- ments	Trans- fers	Existing
Police Pension Fund. Fire Department Re-	9,299	4,341	862	450	1,295	373	• • •	10,660
lief Fund Teachers' Retirement Fund:	4,094	1,734	223	161	195	354	15	4,880
Men	1,975	895	243	56	111	54	1	2,505
Women Health Department Pension Fund:	13,981	7,320	3,111	362	208	532	1	17,087
Men	890	618	389	44	5	54	56	960
Women College of the City of New York Retire-	323	584	318	9	•••	2	32	546
ment Fund City of New York Employees' Retire- ment Fund:	203	100	80	6	•…	3	•••	214
Clerks	6,011	8,913	5,083	698		40°	1,374	7,729
Laborers	8,165	9,218	5,564	1,377		39*	1,037	9,366
Mechanics Department of Street Cleaning Relief and	4,333	5,172	3,048	489	•••	31*	587	5,350
Pension Fund Supreme Court, First Department, Re-	5,236	3,219	2,190	487	372	26	46	5,334
tirement Fund Supreme Court, Second Department,	214	75	6	35	9	•••	1	238
Retirement Fund	92	46		17		1*	2	118
Grand Total	54,816	42,235	21,117	4,191	2,095	1,509	3,152	64,987

^{*}These are technically disability retirements but on account of service limitation they are used as service retirements.

The division of the city employees into classes requires some further explanation. The policemen, the firemen, the school teachers, the street cleaners and the health officers were, of course, distinguished because each of them had its own special fund. All city employees not covered by one of the special funds are legally included under the Grady Law, but they

constitute by no means a homogeneous class. Some division of the employees under this law seemed, therefore, imperative. Various possible bases of division were tested, by comparing the crude rates of separation from the service prevailing in the different occupations and in the different branches of the service, but they were not as satisfactory as was hoped, and finally a simple occupational division was adopted. Three classes were recognized: (1) the clerks, administrators, and technical employees designated in the tables simply as clerks; (2) the mechanics and skilled workers designated simply as mechanics, and (3) the general laborers. All elected, appointed and exempt employees were excluded from the tabulations upon which the experience tables were based because of the probable differences between them and the regular civil service employees in respect to salaries, class of work and tenure of office. The pensions of this special group were valued, however, by use of tables prepared for other groups.

The differences between the experience of men employees and that of women employees require naturally special consideration. In the few divisions where women are employed in large numbers and form a considerable proportion of the total number of employees, as is notably the case in the teaching force, the two sexes were distinguished throughout the valuation. Where the number of women was small they were omitted from the tabulations on which the experience tables were based and their pensions were subsequently valued by the use of the tables for the men.

Pensioners

The following table summarizes the experience tabulated as a basis for mortality tables for employee pensioners. The detail is shown in all cases where it was recorded as a basis for exposure tables, even though such exposure was used only as indicative of the rate to be adopted.

TABLE 2—SUMMARY OF ACTUAL EXPERIENCE—EMPLOYEE PENSIONERS—ALL FUNDS

Fund or Class	Survivors	Entrants	Deaths	Existing
Police Pension Fund:				
Disability Pensioners	876	1,307	372	1.811
Service Pensioners	803	368	336	835
Fire Department Relief Fund:	553	300	330	"33
Disability Pensioners	185	196	113	268
Service Pensioners	_	346	122	558
Teachers' Retirement Fund:	334	340	1.2.2	330
Men—		1		l
	1	10	T	10
Disability Pensioners	_		_	
Women—	34	133	70	97
		282		1
Disability Pensioners	79		40	321
Service Pensioners	773	545	180	1,138
Health Department Pension Fund:				
Disability Pensioners	. 5 18	5 58	2	8
Service Pensioners	18	58	4	72
Department of Street Cleaning Relief and				
Pension Fund:				
Disability Pensioners		307	68	239
Service Pensioners		24	3	21
Total:				
Disability Pensioners	1,146	2,107	596	2,657
Service Pensioners	1,062	1,474	715	2,721
Grand Total	3,108	3,581	1,311	5,378

TABULATION OF SALARY RECORDS

The tabulations used to determine rates of salary change were based on a period of five years. A five-year period (instead of the six-year period used for the other data) was adopted merely as a matter of expediency. To have based the salary experience on the six-year period would have necessitated the use of an extra punch card because of the amount of information to be recorded, and would accordingly have nearly doubled the amount of work required. The added degree of accuracy thereby achieved could not have compensated for the added expense and labor involved. It is doubtful if the rates based on the six years' experience would have been substantially different from the rates based on five.

In the tabulation for salary scales the cards representing members of the active force were kept separate from those representing persons on pension so that any selection of persons for retirement which might result from differences in salaries could be studied. Each card was tabulated separately for each year's salary reported by an employee, according to the age of such employee at the time the salary was received. The payroll exposure for salary scales was tabulated directly in a form suitable for use. The following table summarizes the total exposure:

TABLE 3—SUMMARY OF EXPOSURE—SALARY—ALL FUNDS

Fund or Class	Number of Annual Salaries	Total Payroli
Police Pension Fund	49,846	\$70,135,060
Fire Department Relief Fund	22,121	33,682,260
Teachers' Retirement Fund:		1
Men	11,513	24,123,620
Women	77,042	93,072,678
Health Department Pension Fund:	•	
Men	4,508	4,936,150
Women	2,331	1,854,860
College of the City of New York Retirement Fund	1,011	2,085,850
City of New York Employees' Retirement Fund:		
Clerks—	0	
Men	33,857	46,902,030
WomenLaborers—	4,935	4,750,500
Men	40 500	20 776 070
Women	42,599	33,776,910
Mechanics	2,559	36,105,350
Department of Street Cleaning Relief and Pension Fund	23,931	20,736,860
Supreme Court, First Department, Retirement Fund	24,937 1,026	2,327,300
Supreme Court, Second Department, Retirement Fund	516	1,162,600
Supreme Court, Second Separtment, Netwenter Pund	310	1,102,000
Total	302,732	\$376,781,858

COMPILATION OF FAMILY HISTORY STATISTICS

The preceding summaries show the experience which was used as a basis for constructing the tables necessary in the valuation of pensions to the employees themselves. The question of pensions to dependents, that is, widows, children, and dependent parents, must, however, be considered, as pensions to certain members of the family have been allowed in at least four of the pension funds. The experience tables for family history were

at first developed by departments, but after comparison they were consolidated and the resulting set of tables was used for all departments. For this reason all work relating to family history has been covered in a separate section of this report. The following tabular statement gives an idea of the number of reports which were used:

TABLE 4—SUMMARY OF NUMBER OF PERSONS CONSIDERED IN EXPERIENCE FOR FAMILY HISTORY TABLES—ALL FUNDS

Class					
Employees. Wives. Widows. Children. Dependent Parents.					
Total	83,907				

TABULATION OF ACTIVE SERVICE AND PENSION ROSTERS The active service

Tabulations to show the number and salaries of employees in the active service, classified by age and length of service, were made in detail as of June 30, 1914. The following summary shows all active employees who were considered in the valuations. The details are given under the discussion of the specific groups considered.

TABLE 5—SUMMARY OF NUMBER AND SALARIES OF ACTIVE EMPLOYEES CONSIDERED IN VALUATIONS—ALL FUNDS

Fund or Class	Number	Salaries
Police Pension Fund	10,783	\$15,169,590
Fire Department Relief Fund	5,000	7,515,390
Teachers' Retirement Fund:		
Men	2,608	5,713,940
Women	17,980	23,176,430
Health Department Pension Fund:	04-	
Men	867	968,170
WomenCollege of the City of New York Retirement Fund	395	316,060
City of New York Employees' Retirement Fund:	218	484,100
Clerks—		
Men	9,745	12,086,380
Women.	2,532	2,104,500
Laborers—	-,33-	-1-941390
Men	10,841	8,449,750
Women	1,174	446,030
Mechanics	6,064	9,059,650
Special Employees—	• •	" " " "
Exempt	2,500	4,490,830
Elected	172	1,866,000
Appointed	160	839,300
Department of Street Cleaning Relief and Pension Fund	5,426	4,533,370
Supreme Court, First Department, Retirement Fund	294	673,550
Supreme Court, Second Department, Retirement Fund	138	322,400
Total	76,906	\$99,206,430

Pensioners

The number of pensioners on the rolls who were considered in the valuations are shown in the following summary. Details regarding each class will be found under the discussion of the service from which the pensioner was retired.

TABLE 6—SUMMARY OF NUMBER AND PENSIONS OF ALL PENSIONERS CONSIDERED IN VALUATIONS—ALL FUNDS

Fund or Class	Number	Pensions
Police Pension Fund:		
Employees	2,716	\$2,010,761
Widows	1,441	434,020
Children	124	14,830
Dependent Parents	i	600
Fire Department Relief Fund:		
Employees	800	704,510
Widows	660	226,000
Children	70	15,040
Dependent Parents	48	16,200
Teachers' Retirement Fund:	4-	
Men Employees	82	111,720
Women Employees	1,439	1,074,170
Women Employees	-1739	-,0,4,-,0
Men Employees	78	72,010
Women Employees	3	1,710
Widows	10	3,000
Children	1	300
Dependent Parents	ī	300
College of the City of New York Retirement Fund	4	4,330
City of New York Employees' Retirement Fund:	•	1 7,330
Clerks	43	45,110
Laborers	43 37	18,050
Mechanics	37 26	10,410
Department of Street Cleaning Relief and Pension Fund:	20	19,410
Employees		140,700
Widows	321 106	22,100
Children		410
Dependent Parents	7	600
Supreme Court, First Department, Retirement Fund	3	1
Supreme Court, First Department, Retirement Fund	9	10,230
Supreme Court, Second Department, Retirement Fund		900
Total:		
Employees	5,658	\$4,305,501
Widows	2,226	685,120
Children	202	30,580
Dependent Parents	53	17,790
Grand Total	8,139	\$5,038,991

EXPOSURE AND CHECK TABLES EMPLOYED DEVELOPMENT OF MORTALITY AND SERVICE EXPOSURE

From the actual experience tables, summaries of which have already been given, exposed to risk tables were prepared showing by ages the number of persons exposed to the risk of leaving the service from the various causes. The development of the mortality and service exposure tables can perhaps be best discussed under the two headings of active service experience and pensioners' experience.

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The active service

The exposure columns for the active service were developed for most of the funds on the aggregate basis, but in a few branches of the service, as has been previously mentioned, the rates of withdrawal in the early years of service were so high that a select basis had to be used for the first years. The method of deriving the aggregate exposure columns where the aggregate basis was used, and the ultimate exposure columns where the select basis was used for the earlier years is shown in the following formula:

$$E_z = E_{z-1} + (b+n-e-\frac{1}{2}t)_z - (w+d+ir+or+\frac{1}{2}t)_{z-1}.$$

The symbols employed are as follows:

x = age nearest birthday

 E_x = the number exposed to risk at age x after any period of service.

 b_s = the number of the survivors in the fund at the beginning of the experience at age x.

 n_x = the number of entrants during the experience at age x.

 e_x = the number existing in the fund at the close of the experience at age x.

The number of separations from the fund during the experience are shown as:

 t_x = transfers between the ages of x and x + 1.

 w_s = resignations and dismissals between the ages of x and x + 1.

 d_x = deaths between the ages of x and x + 1.

 i_{r_x} = disability cases between the ages of x and x + 1.

 ${}^{0}r_{x}$ = service retirements between the ages of x and x + 1.

The results obtained by the above method were checked by the formula

$$E_{x} = \sum_{n=0}^{\infty} (b+n-e)_{x} - \sum_{n=0}^{\infty-1} (w+d+ir+0r+t)_{x} - \frac{1}{2}t_{x}.$$

A summary of the exposure columns for each branch of the active service that was thus treated on the aggregate basis throughout, together with the aggregate exposure of those funds treated on the select basis, is given in the following tables. In order to give a better idea of the experience another column has been added to show the total separations from the service.

TABLE	7—SUMMARY	OF	EXPOSURE	AND	SEPARATIONS—
	ACTIVI	E SE	ERVICE—ALL	, FUN	DS

Fund or Class	Exposed to Risk	Separations from Service
Police Pension Fund	63,330.0	2,980
Fire Department Relief Fund	27,210.5	933
Men	13,984.5	364
Women	98,463.5	4,213
Men	6,120.0	492
*Women	1,421.0	231
College of the City of New York Retirement Fund	1,383.0	89
Clerks	48,925.0	5,821
Mechanics	33,388.0	3,568
Laborers	62,154.5	6,080
Department of Street Cleaning Relief and Pension Fund Supreme Court, First and Second Departments, Retirement	35,913.0	3,075
Funds	1,958.5	68
Total	394,251.5	28,814

^{*}N. B.—Values for women in Health Department are for first three years of service only.

For the branches of the service where the select basis was used for the earlier years—namely, the Health Department Pension Fund, the Department of Street Cleaning Relief and Pension Fund, and the three divisions under the City of New York Employees' Retirement Fund, the actual experience data were tabulated by separate years of service for the number of years that seemed essential. From these tabulations each select exposure column was derived by use of the formula:

$$E_{[s]+t} = n_{[s]} + \sum_{i=0}^{t=t} (b-e)_{[s]+t} - \sum_{i=0}^{t=t-1} (w+d+ir+0r+t)_{[s]+t} - \frac{1}{2}i_{[s]+t}$$
 where

 $E_{[x]+t}$ = number exposed to risk at age x + t in their (t + 1)th year of service after entering at age x.

 $n_{[x]}$ = number of employees who entered service during the period of experience at age x.

 $b_{[x]+t}$ = number of survivors at the beginning of the experience with a service of exactly t years after entry at age x.

 $s_{[x]+t}$ = number existing at end of experience with a service of exactly t years after entry at age x.

 $w_{[x]+t}$; $d_{[x]+t}$; $i_{r_{[x]+t}}$; $0_{r_{[x]+t}}$; $t_{[x]+t}$ * = number of employees leaving the service for various causes during their (t+1)th year of service after entry at age x.

For a detailed presentation of the exposure columns derived by the use of this method, reference should be made to the separate discussion under each branch of the service for which the select basis was used.

^{*} Note—Large lower case t indicates transfers and must not be confused with small t used as a subscript, which represents time.

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Pensioners

Exposure columns for the pensioners were developed from their actual mortality experience by use of the formulae similar to those used for the branches of the active service where the aggregate basis was employed. A formula of this type was used instead of the ordinary formula for mortality exposure because of the necessity of developing rates of marriage and of revocation in addition to death rates for widows. In the case of employee pensioners the symbol \boldsymbol{w} was not employed as there were no terminations of pensions by causes other than death.

The general formula employed was

$$E_z = E_{z-1} + (b+n-e)_z - (d+w)_{z-1}$$

and the work was checked by

$$E_{z} = \sum_{s=0}^{s=z} (b+n-s)_{z} - \sum_{s=0}^{s=z-1} (d+w)_{z}.$$

The following table gives a summary of the exposure columns for service pensioners and for disability pensioners, together with a statement for each class of the number of deaths and revocations combined. Similar data relating to dependents will be found in the discussion of family history statistics.*

TABLE 8—SUMMARY OF EXPOSURE AND SEPARATIONS— EMPLOYEE PENSIONERS—ALL FUNDS

	Service Pensioners		Disability Pensioners	
Fund or Class	Exposed to Risk	Deaths	Exposed to Risk	Deaths
Police Department Pension Fund	5,105	336	8,445	372
Fire Department Relief Fund	2,859	122	1,420	113
Men	855	70	33	1
Women	5,885	180	1,437	40
Health Department Pension Fund	240	4	44	2
City of New York Employees' Retirement Fund:	•••	• • •		•••
Clerks	• • •		• • • •	• • •
Laborers	• • •			• • •
Mechanics	• • •	• • • • • • • • • • • • • • • • • • • •		•••
Pension Fund	26	3	364	68
ments Retirement Funds	• • •	• • • •		
Total	14,970	715	11,743	596

NOTE.—The experience was insufficient to justify tabulation in departments for which no figures are given.

^{*} For these data see page 348.

GRADUATION OF UNADJUSTED RATES

Unadjusted rates were prepared from the exposure tables. Such rates as

$$\frac{w_x}{E_x}$$
; $\frac{d_x}{E_x}$; $\frac{{}^0r_x}{E_x}$; $\frac{{}^ir_x}{E_x}$;

were used where the exposure was of sufficient magnitude to give satisfactory results and in cases where the exposure was light the data were combined in five-year groups and unadjusted rates were derived for the central years.

The graphic method of graduation was employed practically throughout the work as it has a marked advantage over the methods of finite differences in work of this kind where the data are not very extensive and where the character of the curve ofttimes undergoes frequent changes. The advantages of the graphic methods were enhanced by plotting the unadjusted values on a co-ordinate paper, having the ordinate divided according to a mathematical series so that the smaller decimals of low rates in the earlier ages could be plotted on the same sheet with the rates for the later ages and still be on a scale of sufficient magnitude to permit of their being read accurately to four significant figures. The divisions along the abscissa were equally spaced and represented years and half years. Paper so ruled furnished the means of obtaining the maximum mechanical assistance from the spline and permitted the entire curve to be considered at one time. Indeed, many of the curves were derived from a single sweep of the spline. The paper employed was 24 by 34 inches in size; its general form is indicated by the charts presented in this report, although much of the ruling has been omitted to facilitate reproduction.

CHECKING OF RATES BY COMPARISON WITH SIMILAR RATES DERIVED IN OTHER VALUATIONS

All adjusted rates derived by graduation were checked back to the original data by the customary method of comparing the actual cases with the expected and accumulating the differences. Rates given as derived from the original data all check very closely with these data and, unless so stated in the text, have not been increased nor decreased to make them either more or less conservative from the standpoint of the solvency of the funds. This point must be borne in mind by any one using the tables as a basis for calculating premium or contribution rates for the pension systems.

Comparisons between the various derived rates and similar rates in other funds were made frequently during the preparation of the rates as a check on the accuracy of the work, but such comparisons cannot be shewn in the report because of lack of space. In the preparation of rates for certain funds every rate derived could be contrasted with one or more comparable rates in similar funds, whereas for certain other funds no comparisons could be made because no comparable rates from other funds were available. In such cases the best that could be done was to compare the rates first with those in funds covering persons of a somewhat similar class,

where the rates might reasonably be supposed to be higher and then with rates of other similar classes where they might reasonably be supposed to be lower.

A simple method of making such comparisons with rates in other services was found effective. All rates of a given type which the Commission was able to secure were plotted on a sheet of transparent paper. These sheets were of exactly the same size as those used by the Commission in plotting the curves which it developed and they were prepared with exactly the same scales and rulings. As soon, for example, as a mortality curve was developed by the Commission the transparent sheet carrying the mortality curves obtained from other funds was placed over it. The new curve was thereby shown among all other available curves which were comparable and any similarity between it and the curve of any other fund was immediately apparent whether the similarity in form or in magnitude existed throughout or only within certain age limits. Such comparisons facilitated intelligent graduation of the rates and in cases where the basic data were meagre the procedure was most helpful as it tended to indicate whether the rates to be used should be based solely on the graduated experience or whether they should be modified to make them conform with some other more extensive and apparently more reliable experience.

That this work necessitated a considerable exercise of judgment and discretion and was beset with many difficulties must be borne in mind throughout the discussion of the various funds. In some funds the experience relating to certain separations from the service was apparently adequate, whereas that relating to others was obviously insufficient. Disability rates in some cases, therefore, had to be based on those prevailing in other funds, and compensating allowances had to be made in the rates of resignation, dismissal, death, etc., based on the actual experience; in other cases the rates of death or disability could be secured from the experience but they had to be subdivided, according to the occurrence or nonoccurrence of the event, while the employee was in actual performance of duty, on the basis of rates from other sources. Over 250 graduated rates of this type had to be developed and consequently the small staff available for the undertaking was forced to resort to every mechanical aid available and the work had to be so divided that employees skilled in graduation could devote their entire time to it, leaving all routine tasks in the nature of checking and verifying to computing machine operators.

In the preparation of some of the rates where the data were scarce the graduator was forced to use his best judgment as to what rate should be accepted as correct; however, no attempt has been made to conceal the fact in cases where such procedure was necessary, and wherever the rates are based at all upon the exercise of discretion, this fact is stated in the text. Naturally every effort has been made to obtain the most reliable set of basic rates possible at the present time. In the future the rates will doubtless have to be corrected from time to time to meet changes in the effectiveness of pension administration, and in the general changes which affect the conditions of health and the hazards of the employees. It is believed, however, that in the aggregate the rates here given represent the most reliable and the most scientific bases on which any premium rates or estimates of future cost may be predicated at this time.

CONSTRUCTION OF MORTALITY AND SERVICE TABLE

AGGREGATE TABLES

Aggregate mortality and service tables were prepared by the direct application of the decrement rates to an assumed radix. The general active service table with four decrement columns was developed as follows:

$$l_{x+1} = l_x - (w + d + {}^{i}r + {}^{0}r)_x$$

where

$$w_x = l_x \cdot {}^{w}q_x$$
; $d_x = l_x \cdot {}^{d}q_x$; $i_{xx} = l_x \cdot {}^{i_{xx}}q_x$; $0_{xx} = l_x \cdot {}^{0_{xx}}q_x$

 $q_x = \text{rate of withdrawal by resignation and dismissal.}$

 $^{d}q_{x}$ = rate of mortality in service.

" q_x = rate of disability retirement.

 ${}^{or}q_x$ = rate of regular or service retirement.

and it might be added that

 $dw q_x =$ rate of withdrawal by dismissal.

 $r_{x}q_{x}$ = rate of withdrawal by resignation.

$$\therefore {}^{\mathbf{w}}q_{z} = {}^{\mathbf{d}\mathbf{w}}q_{z} + {}^{\mathbf{r}\mathbf{w}}q_{z}.$$

 $^{*d}q_x$ = rate of death by accident.

 $^{\circ d}q_x$ = rate of death from other causes.

$$\therefore {}^dq_x = {}^{*d}q_x + {}^{0d}q_x.$$

The l_x column was checked by

$$l_{z+1} = l_z[1 - (^{\omega}q + ^{d}q + ^{\omega}q + ^{or}q)_z]$$

and the entire table by

$$l_x = \sum_{r=-\infty}^{m=n_0} (w + d + {}^{i}r + {}^{0}r)_x.$$

The symbol " ω " will be used throughout to indicate the highest age shown in the table being considered.

Similar methods were employed in constructing mortality tables for pensioners. Attention is called to the fact that in the tables a small letter has been affixed to the symbols to indicate the class to which the symbol applies; for example, the small (a) indicates that the symbol was taken from a table dealing with the active service; the affix (p) indicates that the symbol applies to regular pensions; the affix (i) indicates that the symbol applies to disability pensions, etc. In the general formulae given in the first part of this section the limiting affix has been considered unnecessary and therefore omitted.

TABLES IN SELECT FORM

Tables on a select basis were not adopted because of any desire to introduce further refinement in the work but because such a basis seemed the most feasible method of overcoming the difficulties presented by the wholesale separations from the service that are characteristic of the earlier years of employment, in certain branches of the city government. To have

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applied the customary method of constructing tables on a select basis in developing the service and mortality tables for those branches of the service for which the select basis had to be employed would have necessitated an expenditure of time and money that seemed almost prohibitive. Tables which on an aggregate basis would have consisted of five, six or seven columns would have contained on the ordinary select basis, twenty, twenty-four or twenty-eight columns; and for many of the added columns commutation columns and special reserve values would have been required.

Methods were tested whereby certain classes, such as those with six months, a year, a year and a half, or even two years of service, were excluded from the basis of the experience, but the results did not commend them for use. A select basis seemed imperative. Finally a method was devised which gave practically the same results as the ordinary method but which did not involve as great an amount of labor in its application. Although the method is supposedly new, its application is simple. Briefly stated, it consisted in developing those rates which are most strongly influenced by the employees' length of service, namely, the rates of resignation and dismissal, directly from the experience tabulated on a select basis, for the minimum number of select years necessary, and to develop all other rates from the ultimate experience. The select rates for the other contingencies, such as death, invalidity and regular retirement were made up not by the use of the experience of the first two or three years but by the use of modifications of the ultimate rate. The work was so handled that these modifications of the ultimate rates, when used in the development of a select table, would give in certain decrement columns the same numerical value to the decrement for any one age and cause, no matter what the length of service. The ultimate table was constructed by the same method used for the aggregate tables; the only difference being that rates developed from the ultimate experience were used in place of aggregate rates. The method employed in adding the select columns may be expressed symbolically, in the case of a table having the rates of resignation and dismissal thus derived from the select experience and other rates from the ultimate, as follows:

$$l_{(z)+t} = \frac{l_{(z)+t+1} + (d + {}^{i}r + {}^{0}r)_{z+t}}{1 - ({}^{rw}q + {}^{4w}q)_{(z)+t}},$$

$$dw_{[s]+t} = l_{[s]+t} \cdot {}^{4w}q_{[s]+t}; \quad {}^{r}w_{[z]+t} = l_{[s]+t} \cdot {}^{rw}q_{[z]+t},$$

and as previously mentioned

$$d_{[x]+t} = d_{x+t}; \quad {}^{i}r_{[x]+t} = {}^{i}r_{x+t}; \quad \text{etc.,}$$

therefore the select rates shown in the charts, where not developed from the experience were derived as follows:

$${}^{d}q_{[z]+t}=\frac{d_{z+t}}{\overline{l_{[z]+t}}};\quad {}^{\iota_{r}}q_{[z]+t}=\frac{{}^{\iota_{r}}_{z+t}}{\overline{l_{[z]+t}}};\quad \text{etc.}$$

Perhaps a better understanding of the procedure can be obtained by referring to one of the tables in select form shown later in this report. (See pages 145-148). The use of a table thus constructed removes the necessity of computing additional commutation columns except for values

involving the columns for resignation and dismissal, though of course the commutation columns based on the number living had to be developed just as in the ordinary select table. The necessity of carrying the valuation detail on a select basis is not obviated by the use of such tables; however, the method effected a very great saving of time over what would have been required had the valuations been made on a select table developed in the customary manner.

PREPARATION OF SALARY SCALE

The salary scale is simply a series of ratios developed by graduating the average salaries of employees classified by age. The salary data for persons on the pension roll were kept separate from those for active employees, as has previously been noted, in order that any selection of higher or lower priced employees for retirement on pension might be studied. Not only were the two classes kept separate in the tabulations, but their respective salary scales were graduated separately before the final salary scales were constructed. It was thought that a salary scale thus developed could be used more safely than one derived directly from the data for the active force alone or from all data combined without distinction. A single salary scale was constructed for each department except the Health Department. A discussion of the scales employed in the Health Department will be found under that section of the report relating to that particular branch of the service.

Tests of the salary scales were made during the progress of the work by taking the salaries of employees in certain departments as they were a few years ago, estimating what they would be during the next few years according to the salary scale, and then comparing the results with the actual salaries. This test was made for the Fire Department. The salaries of all employees who had remained in the service for three years were taken as of the beginning of the first year and by the use of the salary scale for that department their salaries for each of the succeeding three years were estimated. The results were then compared with the salaries which this group of employees had actually received and in no year was a difference of more than 1% found between the total actual salaries and the total estimated salaries. These results were considered good, but it was thought that the test might have been unduly favorable to the salary scale because the scale had been developed from the experience during a period which included the three years tested: consequently a test was made for the Police Department, for which a salary scale was available, developed on the experience ending in 1912. Actual salaries were compared with salaries estimated by means of the old salary scale, and the correspondence was even closer than in the case of the Fire Department, a fact which seemed to indicate that the use of salary scales for estimating future salaries is justified. If the experience be watched closely and the scale modified from time to time, if necessary, rates of salary change would appear to be as reliable as certain other rates that have been generally accepted as proper and suitable bases for pension fund calculations.

INTEREST RATE ADOPTED

An interest rate of 4% was used in making the computations.

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DERIVATION OF MONETARY VALUES

The valuations were prepared by computing for each age the reserve required for a salary of one to meet each pension benefit allowed under the fund and then multiplying the results thus obtained into the salaries of the employees at that age. In benefits dependent on years of service as well as age, the salaries of employees at a given age were grouped by five-year service periods and were valued by use of the reserve for the central year of each group. In funds where select tables were necessary, the employees who had less than four years' service were not, of course, grouped in fiveyear periods. So many pension benefits are involved in the various funds that it is not practicable to present all the formulæ used. A few general formulæ may, however, be given to indicate the general methods followed in preparing reserve values and contribution or premium rates. All symbols appearing in the following formulæ which are not there defined will be found in the headings of the mortality and similar tables presented in the discussion of the individual funds. In the formulæ an attempt has been made to secure practical accuracy and to avoid refinements which did not seem warranted by the extent and accuracy of the basic data. The equality sign has therefore been employed in the formulæ wherever its use was considered practically accurate, including cases in which a slight mathematical inequality was involved, resulting simply from the absence of some such nice refinement.

The formulæ given are those directly applicable for use in connection with aggregate tables. When tables in the select form were employed, the reserves were computed in the same general manner; the only difference was that in place of values taken from aggregate tables as shown in the formulæ, corresponding values were taken from the select tables.

All formulae relating to the valuation of pensions to dependents are given in the section of the report dealing with statistics of family history.

CONTRIBUTION ANNUITIES

(A) The present value of the total future salaries of employees in the service at age x was computed as follows:

 $l_x^{(a)}$ = number living at age x according to active service table.

$$D_x = l_x^{(a)} \cdot v^x$$

$$D_x' = s_x D_x$$

$$N_x' = \sum_{x=x+1}^{x=\infty} D_x'$$

$${}^a a_x = \frac{N_x'}{D_x'}$$

$${}^a \bar{a}_x = \frac{N_{x-\frac{1}{2}}}{D_x'} = \text{present value equated to a salary of one.}$$

... ${}^{a}\bar{a}_{x}$ · [present salary of employees at age x] = present value of total future salary.

In funds where tables in the select form were used the salaries of employees were classified by length of service and separate values were computed for each class.

DISABILITY BENEFITS

The legal provisions of the different funds in respect to the payment of disability pensions present numerous variations; benefits are made contingent on the employee having served a certain minimum period before the breakdown, or on the disability having occurred in performance of duty, etc. To show the formulæ employed in every case would require so much space that such procedure has not been considered feasible. The following formulæ apply to the more general disability pension provisions. The special formulæ used for specific benefits were developed by similar principles.

- (B) The present value of disability pensions payable after certain definite periods of service, such as ten years, based on final salary, for employees in the service at age x was computed in the following manner:
- $l_x^{(i)}$ = number living at age x according to the disability pensioners' table.

$$\begin{split} D_x^{(i)} &= \vec{l}_x^{(i)} \cdot v^x, \qquad N_x^{(i)} &= \sum_{x=x+1}^{x=\omega} D_x^{(i)}, \\ \vec{a}_x^{(i)} &= \frac{N_{x-\frac{1}{2}}^{(i)}}{D_x^{(i)}}, \qquad \vec{a}_{x+\frac{1}{2}}^{(i)} &= \frac{1}{2} (\vec{a}_x^{(i)} + \vec{a}_{x+1}^{(i)}). \end{split}$$

 $r_x^{(a)}$ = disability retirements between the ages of x and x + 1, according to the active service table.

$$\begin{split} & {}^{i}r_{x}^{(a)} \cdot v^{x+\frac{1}{2}} \cdot \bar{a}_{x+\frac{1}{2}}^{(i)} = {}^{ir}\overline{C}_{x}, \\ & s_{x+\frac{1}{2}} = \frac{1}{2}(s_{x} + s_{x+1}), \\ & {}^{ir}\overline{C}_{x}^{*} = s_{x+\frac{1}{2}} \cdot {}^{ir}\overline{C}_{x}, \\ & {}^{ir}\overline{M}_{s}^{*} = \sum_{x=-\infty}^{x=-\infty} {}^{ir}\overline{C}_{s}^{*}. \end{split}$$

- Let n = years of service of employee, with the condition that whenever it appears in a formula, it shall not be given a greater value than the number of years of service required for the employee to become eligible for the pension benefit under consideration.
- If n = years of service of employees, where maximum years considered is 10, then the value of the pension equated to a salary of one at age x, for an employee with n years of service is

$$\frac{{}^{\iota_{r}}\underline{M}_{x+10-n}^{s}}{D_{x}^{s}}$$

 \mathbf{a} nd

$$\frac{{}^{"}\overline{M}_{z+10-n}^{"}}{D_{z}^{"}} \cdot \left[\begin{array}{c} \text{Present salaries of employees at age } x \\ \hline \text{with } n \text{ years of service} \\ \hline 2 \end{array} \right]$$

= present value of disability pensions of half salary on disability after 10 years' service.

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Expressing the value of such a pension of one half salary on disability as a percentage of annual salary to be contributed during active service, we have

$$\frac{50^{tr} \overline{M}_{x+10-n}^{s}}{N_{x-1}^{s}} = \text{percent of salary to be contributed to provide the}$$

$$\text{above disability pension for an employee now}$$

$$\text{at age } x \text{ with } n \text{ years of service.}$$

(C) The present value of disability pensions payable after certain definite periods of service, such as ten years, based on both final salary and length of service, for employees in the service at age x, was calculated as follows:

$${}^{\iota_{\tau}}\bar{R}_{z}^{\bullet}=\sum_{n=0}^{z=u}{}^{\iota_{\tau}}\overline{M}_{z}^{\bullet}.$$

The symbol n' will be used throughout to indicate the years of service of employee in excess of maximum which can be given to n, so that (n + n') = actual years of service.

Using these new symbols, in connection with those already developed, we have the value of the pension equated to one of salary at age x, as

$$\frac{[10+n']^{\iota_r} \overline{M}^{\iota}_{z+10-n} + {}^{\iota_r} \overline{R}^{\iota}_{z+10]-n}}{D^{\iota}_{z}}.$$

If the allowance on retirement be $1\frac{2}{3}\%$ of final salary for each year of service, then

$$\frac{(10+n')^{t_r}\overline{M}_{z+10-n}^s+{}^{t_r}\overline{R}_{z+10\frac{1}{2}-n}^s}{D_z^s}\left[\frac{\text{Present salary of employees at}}{\text{age }x\text{ with }(n+n')\text{ years' service}}{60}\right]$$

= present value of pension of 1\frac{2}{3} percent of final salary for each year of service on disability after 10 years' service.

The percentage of salary required to provide this benefit is shown in the following:

$$\frac{\frac{10}{6}[(10+n')^{\iota_{p}}\overline{M}_{z+10-n}^{\iota}+{}^{\iota_{p}}\overline{R}_{z+10\frac{1}{2}-n}^{\iota}]}{N_{z-1}^{\iota}}$$

= percentage of salary to be contributed to provide for pension of 13 percent of final salary for each year of service on disability after 10 years' service.

REGULAR OR SERVICE BENEFITS

Among the pension funds discussed in this report none is confined to a superannuation benefit allowable on the sole condition that the employee has reached a certain age, although many have a provision permitting retirement at a certain age provided the minimum requirement as to length of service has been fulfilled. In other funds service benefits may be claimed by the employees after certain definite periods of service regardless of age. The laws do not provide that employees must retire on becoming eligible; retirement is optional, and consequently it is necessary in all cases to employ a retirement rate.

In valuing benefits granted only on the fulfilment of service and age conditions it was necessary to combine methods suitable for valuing superannuation pensions with those applicable to the valuation of service pensions. In illustrating the methods used, therefore, general formulæ for service retirements will be shown first and then a simple combination formula will be given. Attention is called to the fact that maximum and minimum limitations of the amount of benefits to be paid are not considered in the formulæ presented. Where these limitations were fixed at a certain proportion of the salary the adjustments were added in the formulæ; where they were fixed at certain definite amounts, approximations were employed, based on the distribution of salaries at the different ages, which showed, of course, what proportions of total salaries would be affected by the limitations.

Benefits limited by years of service only

(D) The present value of pensions payable after certain definite periods of service, such as 30 years' service, where the amount of the pension is based on last salary, to employees in the service at age x, was calculated in the following manner:

 $l_x^{(p)}$ = number living at age x according to regular pensioners' table.

$$\begin{split} D_{u}^{(p)} &= \vec{l}_{u}^{(p)} \cdot \vec{v}^{u}, \quad N_{x}^{(p)} &= \sum_{x=x+1}^{z=\omega} D_{x}^{(p)}, \\ \vec{a}_{x}^{(p)} &= \frac{N_{x-\frac{1}{2}}^{(p)}}{D_{x}^{(p)}}, \quad \vec{a}_{x+\frac{1}{2}}^{(p)} &= \frac{1}{2} (\vec{a}_{x}^{(p)} + \vec{a}_{x+1}^{(p)}). \end{split}$$

 ${}^{0}r_{x}^{(a)} = \text{regular or service retirements between the ages of } x \text{ and } x + 1, according to active service table.}$

Before proceeding further with the formula, attention should be called to the introduction of an approximation to allow for an understatement that arises from the use of regular or service retirement rates developed on an aggregate basis. All the retirements on service or superannuation pensions at a given age are necessarily those of persons who are eligible for retirement, having fulfilled the age and service conditions; whereas in the exposure column at that age are some who have not yet fulfilled the minimum service requirement, having entered the service at a later date than those who have retired. The retirement rates as derived on the aggregate basis are therefore lower than they would have been had the exposure column included only those who were eligible to retire. If the rates as developed without consideration of this factor are applied to persons who are now in the service, having entered at ages which mean they will all be eligible for retirement when a certain age is reached, provided they remain in the service that long, the number of retirements and the cost will be understated. The more scientific method of valuing the benefits under these conditions would be to use select rates based solely upon those eligible to retire, but the factors of time and the breadth of the experience rendered such a course impracticable. An allowance has therefore been made to produce more nearly the results which would have been obtained through the use of rates developed on a select basis.

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The method adopted was as follows: All employees of the same age and length of service were, of course, considered in one group by themselves and thus the earliest age at which they could fulfil the minimum age and service requirements and become eligible for retirement on service pension was apparent at a glance. All persons shown by the active service table to have retired on such pensions at earlier ages than the age at which this special group would become eligible were assumed, for the purpose of valuing the benefits for this group, to have remained in the service until the minimum age at which this group would be eligible and thereupon to have retired immediately. The method shows a high rate in the first year, reflecting the probable action of selection, and gives results in substantial harmony with certain data from pension funds which were available for testing its applicability. It seemed the most reliable method available, and although necessarily empirical it is believed that if it err in any way, the variation tends to slightly understate rather than overstate the amount of the liability. In the valuations presented in this report the intention is not to show the maximum liabilities that may be involved, but rather the minimum liabilities for which no assets have been provided. This fact should not be forgotten in using a formula of this type in the calculation rates to be employed by a reorganized fund.

Continuing the development of the formula,

$$\begin{split} {}^{0}r_{x}^{(a)} \cdot v^{s+\frac{1}{2}} \cdot \bar{a}_{x+\frac{1}{2}}^{(p)} &= {}^{0r}\bar{C}_{x}, \\ s_{x+\frac{1}{2}} \cdot {}^{0r}\bar{C}_{x} &= {}^{0r}\bar{C}_{x}^{s}, \\ {}^{0r}\bar{M}_{x}^{s} &= \sum_{a=s}^{s=s} {}^{0r}\bar{C}_{x}^{s}, \\ {}^{d}q_{x}^{(a)} &= \text{rate of mortality in active service.} \\ {}^{d}p_{x}^{(a)} &= [1 - {}^{d}q_{x}^{(a)}], \\ {}^{0r}l_{x}^{(a)} &= ({}^{0r}l_{x-1}^{(a)} + \frac{1}{2}{}^{0}r_{x-1}^{(a)}) \cdot {}^{d}p_{x-1}^{(a)} + \frac{1}{2}{}^{0}r_{x-1}^{(a)}, \\ {}^{0r}l_{x}^{(a)} \cdot v^{x} \cdot s_{x} &= {}^{0r_{1}}D_{x}^{s}, \\ {}^{0r_{1}}N_{x}^{s} &= \sum_{x=x+1}^{s=s} {}^{0r_{1}}D_{x}^{s}, \\ \bar{a}_{x}^{(p)} \cdot {}^{0r_{1}}D_{x}^{s} &= {}^{0r_{1}}C_{x}^{s}, \end{split}$$

If n = years of service of employees, where maximum years considered is 30, then the value of the pension equated to a salary of one at age x for an employee with (n + n') years' service, is

$$\frac{{}^{o_r}\overline{M}_{z+20-n}^{\bullet}+{}^{o_{r_i}}C_{z+20-n}^{\bullet}}{D_x^{\bullet}+{}^{o_{r_i}}D_x^{\bullet}}$$

and

$$\frac{{}^{o_r}\overline{M}_{s+so-s}^{o} + {}^{o_{r_i}}C_{x+so-s}^{o}}{D_x^{o} + {}^{o_{r_i}}D_x^{o}} \begin{bmatrix} \text{Present salaries of employees at age} \\ x \text{ with } (n+n') \text{ years' service} \\ 2 \end{bmatrix}$$

= present value of pensions of one half salary on retirement after 30 years' service. Expressing the value of such a pension of half salary as a percentage of annual salary to be contributed during active service, we have

$$\frac{50({}^{o_r}\overline{M}_{x+\infty-n}^* + {}^{o_r}C_{x+\infty-n}^*)}{N_{x-\frac{1}{2}}^* + {}^{o_r}N_{x-\frac{1}{2}}^* - {}^{o_r}N_{x+2\frac{1}{2}-n}^*} = \text{percent of salary to be contributed}$$
to provide the above service pension for an employee now at age
$$x \text{ with } (n+n') \text{ years of service.}$$

In the preceding formulæ and in the formulæ which follow, the values based on the ${}^{0}r_{l_{2}^{(0)}}$ column are omitted in valuing pensions to persons in the active service who have completed the maximum requirement of service or attained the age of eligibility.

(E) The present value of pensions payable after certain periods of service, such as 30 years of service, where the amount of the pension is based both on last salary and length of service, to employees in the service at age x, was developed as follows:

Using the symbols previously developed and adding,

$${}^{0r}\overline{R}^{\bullet}_{x} = \sum_{x=x}^{x=\omega} {}^{0r}\overline{M}^{\bullet}_{x},$$

we have the general formula

$$\frac{(30+n')^{[{}^{o_r}}\overline{M}^s+{}^{o_{r_i}}C^s]_{x+30-n}+{}^{o_r}\overline{R}^s_{x+30\frac{1}{2}-n}}{D^s_x+{}^{o_{r_i}}D^s_x}.$$

as the value of the benefit, equated to a salary of one at age x, for an employee with (n + n') years of service.

Assuming that the pension payable is one and two-thirds per cent. of final salary for each year of service, then

$$\frac{(30 + n') \left[{}^{o_r} \overline{M}^o + {}^{o_r} C' \right]_{x+30-n} + {}^{o_r} \overline{R}^o_{x+30-n}}{D^o_x + {}^{o_r} D^o_x}$$

$$\begin{bmatrix} \text{Present salaries of } \\ \text{employees at age} \\ x \text{ with } (n+n') \\ \underline{\text{years of service}} \\ \end{bmatrix} = \text{present value of pensions of } 1\frac{2}{3} \text{ percent of final salary }$$
for each year of service on retirement after 30 years' service.}

Expressing the value of such a benefit of 12/3% of final salary for each year of service as a percentage of annual salary to be contributed during active service, we have

$$\frac{\frac{1.0}{6}\{(30+n')[{}^{o_{r}}\overline{M}^{s}+{}^{o_{r_{l}}}\!C^{s}]_{x+30-n}+{}^{o_{r}}\overline{R}^{s}_{x+30]-n}\}}{N^{s}_{n-1}+{}^{o_{r_{l}}}\!N^{s}_{n-1}-{}^{o_{r_{l}}}\!N^{s}_{n+20l-n}}$$

= percent of salary to be contributed to provide the above service pension for an employee now age x with (n + n') years of service.

Benefits limited by both years of service and age

For a simple example of a benefit limited both by length of service and age of employee, we may consider the formulæ required to value the benefits allowed under a specific pension provision in one of the funds considered. The law for this fund provides:

(F) Pension of one-half final salary at age 60, or payable after 20 years' service if employee has attained age 55.

This may be valued by use of the general formula developed under (D) supra, provided certain changes and limitations be employed in determining the value of the subscripts to the symbols.

Obviously employees who entered the service at age 35 or younger will all have had 20 years of service at age 55 and consequently they will not be affected by the limitations regarding service or the age limitations of 60 years. For this class the general expression

$$\frac{{}^{\bullet_{7}}\overline{M}_{55}^{\bullet} + {}^{\bullet_{7}_{1}}C_{55}^{\bullet}}{D_{5}^{\bullet} + {}^{\bullet_{7}_{1}}D_{5}^{\bullet}}$$

may be employed.

Similar reasoning will show that for employees entering at age 40 or older, the limitation regarding retirement at age 60 will be the only one that need be considered. The expression

$$\frac{{}^{\bullet_{7}}\overline{M}_{60}^{\bullet} + {}^{\bullet_{7}i}C_{60}^{\bullet}}{D_{7}^{\bullet} + {}^{\bullet_{7}i}D_{7}^{\bullet}}$$

will cover this group.

For employees entering at age 36, the retirement limitation will be 56; for those entering at age 37, the limitation will be 57 and so on, so that in general

$$\frac{{}^{\bullet_{r}}\overline{M}_{z+2n-n}^{\bullet_{r}} + {}^{\bullet_{r_{1}}}C_{z+2n-n}^{\bullet_{r}}}{D_{z}^{\bullet_{r}} + {}^{\bullet_{r_{1}}}D_{z}^{\bullet_{r}}} \begin{bmatrix} \text{Present salaries of employees at age} \\ \underline{x \text{ with } (n+n') \text{ years of service}} \\ 2 \end{bmatrix}$$

= present value of pension of half salary on retirement.

if we remember that x - n must be used as 35 where its true value is 35 or less, and that it must be used as 40, where its true value is 40 or more. In other cases the true value is the one to be used.

The percentage contribution is developed in the same manner as that derived under (D) provided the specific limitations be kept in mind.

SECTION II

VALUATION OF INDIVIDUAL FUNDS WITH A DESCRIPTION OF SUCH SPECIAL METHODS AS THE PECULIARITIES OF EACH REQUIRED

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7

POLICE PENSION FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Police Pension Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

TO EMPLOYEES

(1) In discretion of Police Commissioner after 20 years of service, or upon application after 25 years' service, if employee has attained age 55, a pension of not less than one-half final salary.

All members are eligible for retirement at age 60, regardless of length of service.

The average allowance has been about 50 per cent. of final salary.

(2) Upon disability incurred in the actual performance of duty, a pension of from one-quarter to one-half final salary.

The average allowance has been about 37 per cent. of final salary.

(3) Upon disability on account of ordinary causes after 10 years' service, a pension of not less than one-quarter of final salary. The average allowance has been about 48 per cent. of final salary. Pensions to employees are for life and are not revocable if granted under provision (1) or provision (3) after 20 years' service.

To widows of employees or pensioners

(4) Upon death of an employee in the actual performance of duty, a pension of a discretionary amount not to exceed \$600 per annum.

The average annuity has been about \$465.

(5) Upon death of an employee from ordinary causes after 10 years' service, a pension of a discretionary amount, not to exceed \$300 per annum.

The average annuity has been about \$300.

(6) Upon death of a pensioned employee, a pension of a discretionary amount, not to exceed \$300 per annum.

The average annuity has been about \$300.

Pensions to widows are terminated automatically by the death or re-marriage of the widow and are revocable.

To CHILDREN OF EMPLOYEES OR PENSIONERS

(7) Upon death of an employee in actual performance of duty, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$600 per annum.

The average annuity during the lifetime of the youngest child has been about \$250.

(8) Upon death of an employee resulting from causes not connected with the performance of duty after 10 years' service, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$600 per annum.

The average annuity during the lifetime of the youngest child has been about \$250.

(9) Upon death of a pensioned employee, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$600 per annum.

The average annuity during the lifetime of the youngest child has been about \$250.

Pensions to children are terminated by death, marriage or attainment of age 18.

TO DEPENDENT PARENTS OF EMPLOYEES

(10) Upon death of an employee in actual performance of duty, provided there be neither widow's nor child's pension, a pension not to exceed \$600 per annum.

For lack of sufficient experience the average allowance to dependent parents was made the same as that to widows of employees killed in the actual performance of duty.

Pensions to dependent parents are terminated by death or remarriage and are revocable.

Contributions

BY EMPLOYEES

Two percentum of salary.

Ву сіту

Indirect contributions:

Miscellaneous revenues, such as excise moneys, permit fees, salary deductions for absences and fines; unexpended balances of salary appropriations, etc.

Direct contributions:

Budgetary appropriations to supplement other revenues as required to meet maturing pensions.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rates of death (1) from causes arising in the actual performance of duty, and (2) from other causes

Rates of disability (1) from causes arising in the actual performance of duty, and (2) from other causes

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

Certain other rates applying to the family of employee which are developed fully in section III, page 305 of this report.

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The schedules for employees were divided into two classes, one including the uniformed force, which is governed by the Police Pension Fund, and the other including the civilian employees who are covered by the City of New York Employees' Retirement Fund. The former class only is considered in this section of the report. The schedules for the latter class were further subdivided and included under the various divisions of the City of New York Employees' Retirement Fund.

Special methods of handling data

The general methods employed in developing the data to show unadjusted rates were those previously outlined. The active service rates used, however, were not developed from the data recorded by the Commission, but were based on data collected previously.

In 1913 the Bureau of Municipal Research of New York submitted to the Aldermanic Committee on Police Investigation a report on the Police Pension Fund which contained an actuarial valuation of that fund. This report presents rates based on the experience of the force for a period of six years. The expected experience derived by the use of those rates has been checked by the Commission against the experience of the Police Pension Fund during the years succeeding that investigation. The difference between the actual and the expected experience was so small that it seemed unnecessary to modify the active service table prepared at that time. The division of the rates of disability and withdrawal are not shown in the previous report, but for the purpose of this report they have been divided. The experience of the fund has of course been used as the basis for this division.

The mortality experience recorded by the Commission was slightly lower than would have been expected from the previous investigation; being about 7 per cent. lower in the case of disability pensioners and about 8 per cent. lower in the case of service pensioners. Because of these differences the mortality rates for pensioners were developed from the experiences in accordance with the general methods discussed in the first section of this report.

The following tables show the extent of the experience:

TABLE 9—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Tumber Exposed to Risk	63,3
otal Number of Separations	2,9
Total Withdrawals	8
Resignations	
Dismissals	5
Total Deaths	4
In Performance of Duty	
Other Causes	
Total Separations by Disability	1,2
In Performance of Duty]
Other Causes	I,2
Total Service Retirements	

TABLE 10-SUMMARY OF EXPOSURE-SALARY

Police Pension Fund

Class	Number of Annual Salaries	Total Payroll
Active Members	47,022 2,824	\$65,654,710 4,480,350
Total	49,846	\$70,135,060

TABLE 11—SUMMARY OF EXPOSURE AND SEPARATIONS— EMPLOYEE PENSIONERS

Police Pension Fund

Class	Exposed to Risk	Deaths
Disability Pensioners	8,445 5,105	372 336
Total	13,550	708

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, diagrams are given on pages 47 and 48, showing the rates plotted on cross-section paper.

TABLE 12—RATES OF SEPARATION FROM ACTIVE SERVICE

	Total Rate of Separation		.0595	.0509	.0437	.0376	.0331	.0300	.0280	.0268	.0260	.0249	.0237	.0225	.0213	.0204	.0202	.0205	.0215	.0228	.0248	.0273	.0307	.0348	.0400	.0470	.0538	9090	.0673
Rate of	Service Retirement	$^{o_r}q_x^{(a)}$:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
17	Total	*p_4,	9000.	2000.	6 000	0100	1100.	.0012	,0014	9100.	6100.	.0022	.0025	.0029	.0034	.0039	.0046	.0055	.0065	9200.	. 000 <u>4</u>	8110.	.0153	610.	.0259	.0327	.0400	.0473	.0542
RATE OF DISABILITY	Other Causes	otrq(a)	:	:	:	:	:	:	:	:	:	:	.000	9000	1100.	9100.	.0023	.0032	.0043	.0055	9200.	7010.	.0145	0010	.0254	.0323	9660.	.0470	.0539
R	In Performance of Duty	$ai_rq_x^{(a)}$	9000.	2000.	6000	0100.	1100.	.0012	.0014	9100.	6100.	.0022	.0023	.0023	.0023	.0023	.0023	.0023	.0022	.0021	8100.	1100.	8000.	.0007	.0005	.0004	.0004	.0003	.0003
	Total	$dq_x^{(a)}$.0026	9200.	.0028	.0028	.0020	.0031	.0032	.0034	.0038	.0041	.0044	.0049	.0053	.0058	.0063	2900.	.0072	.0077	1800.	.0084	9800.	8800.	0600	.0093	.0095	2600.	1010.
RATE OF DEATH	Other Causes	•dq(a)	.0026	9200.	.0027	.0027	7200.	.0028	.0029	.0031	.0034	.0037	.0040	.0045	.0040	.0054	.0059	.0063	8900.	.0073	.0077	.0080	.0082	.008 4	9800.	.0088	0600	.0002	.0095
P.	In Performance of Duty	$adq_x^{(a)}$:	:	1000	1000	.0002	.0003	.0003	.0003	4000	.0004	4000.	4000	4000.	4000.	4000.	4000.	4000	4 000.	\$ 000.	4000.	4000.	4000.	4000.	.0005	.0005	.0005	9000.
VAL	Total	$wq_x^{(a)}$.0563	.0476	.0400	.0338	1620.	.0257	.0234	.0218	.0203	9810.	8910.	.0147	0210.	7010.	.0093	.0083	8/00.	.0075	.0073	1/00.	8900.	.0063	.0057	.0050	.0043	.0036	.0030
RATE OF WITEDRAWAL	Dismissal	$\epsilon_w q_x^{(a)}$.0113	9110.	6110.	.0121	.0123	.0123	.0123	.0122	.0120	7110.	1110.	1010.	0600	6200.	1/00.	4 900.	.0062	1900.	0900	.0059	.0057	.0054	.0040	.0044	.0038	.0032	.0027
RAT	Resignation	$rwq_x^{(a)}$.0450	.0360	.0281	.0217	8910.	.0134	1110.	9600	.0083	6900.	.0057	.0046	.0036	.0028	.0022	6100.	9100.	4100.	.0013	.0012	1100.	6000	8000	9000	.000 5000	4 000.	.0003
	AGE		20	77	55	23	75	25	9	27	78	2	ဓ	31	32	33	8	35	36	37	88	33	\$	7	42	4	4	45	4

TABLE 10-SUMMARY OF EXPOSURE-SALARY

Police Pension Fund

Class	Number of Annual Salaries	Total Payroll
Active Members	47,022 2,824	\$65,654,710 4,480,350
Total	49,846	\$70,135,060

TABLE 11—SUMMARY OF EXPOSURE AND SEPARATIONS— EMPLOYEE PENSIONERS

Police Pension Fund

Clase	Exposed to Risk	Deaths
Disability Pensioners Service Pensioners	8,445 5,105	372 336
Total	13,550	708

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, diagrams are given on pages 47 and 48, showing the rates plotted on cross-section paper.

TABLE 12—RATES OF SEPARATION FROM ACTIVE SERVICE

	Total Rate of Separation		.0595	.0509	.0437	.0376	.0331	.0300	.0280	.0208	.0200	.0249	.0237	.0225	.0213	.0204	.0202	.0205	.0215	.0228	.0248	.0273	.0307	.0348	.0406	.0470	.0538	9090	.0673
Rate of	Service Retirement	or q(a)	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Y.	Total	$^{'}rq_x^{(a)}$	9000.	.000	6000	0100.	1100.	.0012	0014	9100.	6 100 .	.0022	.0025	.0029	.0034	.0039	.0046	.0055	.0065	9200.	4000.	8110.	.0153	7610.	.0259	.0327	.0400	.0473	.0542
RATE OF DISABILITY	Other Causes	otrq(a)	:	:	:	:	:	:	:	:	:	:	.000	9000	1100.	9100.	.0023	.0032	.0043	.0055	9200.	7010.	.0145	0	.0254	.0323	9650.	.0470	.0539
RA	In Performance of Duty	$atrq_x^{(a)}$	9000.	.000	6000	0100.	1100.	.0012	4100.	9100.	6100.	.0022	.0023	.0023	.0023	.0023	.0023	.0023	.0022	.0021	8100.	1100.	8000.	.0007	.0005	.0004	.0004	.0003	.0003
	Total	$dq_x^{(a)}$.0026	9200.	.0028	.0028	.0029	.0031	.0032	.0034	.0038	.0041	.0044	.0049	.0053	.0058	.0063	2900.	.0072	.0077	1800.	.0084	9800.	8800.	0600	.0093	.0095	.0007	1010.
RATE OF DEATH	Other Causes	•dq(a)	.0026	9200.	.0027	.0027	7200.	.0028	.0029	.0031	.0034	.0037	0040	.0045	.0049	.0054	.0059	.0063	8900.	.0073	.0077	80°.	.0082	.008 4	9800.	8800.	o600·	.0002	\$600.
æ	In Performance of Duty	$adq^{(a)}_x$:	:	1000.	1000	.000	.0003	.0003	.0003	.0004	.0004	,0004	,000 4	,0004	,000 4000	,000 4	.0004	,000 4	5 000.	4000.	4000 .	,000 4000	.000 .	,000 4	.0005	.0005	.0005	9000.
7AL	Total	$wq_x^{(a)}$.0563	.0476	.0400	.0338	.0291	.0257	.0234	.0218	.0203	9810.	8910.	.0147	.0126	7010.	.0093	.0083	8200.	.0075	.0073	1,000.	8900.	.0063	.0057	.0050	.0043	.0036	.0030
RATE OF WITEDRAWAL	Dismissal	$\epsilon_{w}q_{x}$.0113	9110.	6110.	.0121	.0123	.0123	.0123	.0122	.0120	7110.	1110.	IOIO.	0600	6200.	1/00.	.0064	.0062	1900.	0900	.0059	.0057	.0054	.0049	.0044	.0038	.0032	.0027
RAT	Resignation	$rwq_x^{(a)}$.0450	.0360	.0281	.0217	8910.	.0134	1110.	966 666	.0083	6900	.0057	.0046	.0036	.0028	.0022	6100.	9100.	4100.	.0013	.0012	1100.	6000	8000	9000	.0005	,000 4	.0003
	AGE		20	71	77	23	4:	52	2 :	77	28	57	ဓ္	31	32	33	%	35	9	37	88	30	우	4	42	5	4	45	δ

DATE

RATES OF RESIGNATION AND DISMISSAL

The rate of resignation considered as a whole is lower in the Police Department than in any other department for which this rate was derived, except the Fire Department.

Dismissals outnumber resignations; in fact about 65 percent. of all withdrawals are dismissals. The dismissal rate, however, does not rank very high as compared with similar rates for other funds for which such a rate was derived; four departments had a higher rate, whereas only two, the Health and the Fire funds, had lower rates.

These two rates combined make up the rate of withdrawal which is the third from the lowest rate among the eleven shown. The only lower rates are those for the Supreme Court and the Fire Department, a fact apparently indicating that employment in the uniformed police force is attractive and, in view of the high retirement rates, that the force is depleted through retirement rather than by withdrawal.

RATE OF DEATH

The rates of death in the active service cover deaths occurring in performance of duty and those resulting from other causes.

The accidental death rate, which includes only those deaths in the actual performance of duty is lower for the police fund than for any of the other three funds for which such a rate was required. The deaths resulting directly from service in the Street Cleaning Department, the Fire Department and the Health Department are shown as higher. This rate, of course, does not reflect the total rate of accident in service, since it covers only fatalities. If the rate of death in the actual performance of duty be combined with the rate of disability in actual performance of duty it will be found that of the three departments—Police, Fire and Health—the Police have a rate higher than Firemen, but lower than employees of the Health Department.

Excepting the street cleaners, the rate of death from other causes among the police is the highest of such rates for the four departments mentioned above.

The total death rate in the active police service secured by combining the deaths in the performance of duty with other deaths stands fifth among the city funds; being exceeded by the rates for the Street Cleaning Department Relief Fund and for the three classes included in the Employees' Retirement Fund. The rate is, however, somewhat higher than rates prepared from the experience of the Royal Irish Constabulary Force, the only other police rate available.

RATE OF DISABILITY

The rate of disability in the actual performance of duty is higher in the Police Pension Fund than in the Health, Fire or Street Cleaning Departments' funds; the only others for which such a rate was developed. Although, taken as a whole, the rate in the police fund is the highest, yet age for age it is higher than the others only up to about age 37, while from about age 41 on it is lower than the other three.

The rate of disability from causes not arising in the actual performance of duty is also highest in the police fund, the rate for that fund being

about double the rate in the Street Cleaning Fund, which is the next highest. Such a difference is very great; in fact the rate is so high that it raises a doubt as to whether all cases of disability are the result of material health impairment. This conclusion may be drawn from the fact that in the period 1908 to 1913 disability retirements constituted nearly half of all separations from the service and were over three times more numerous than retirements on service pension. Over half this large number of disability retirements took place just after the employees had had twenty years of service and before they had had twenty-five years of service. Employees retiring on disability pension are given a discretionary amount within certain limitations. The pension allowable on disability after twenty years of service is as large as any which may be awarded; has a minimum limitation of one-half final salary, and is not revocable.

The total rate of disability, secured by combining the rates for the two classes of disability, is the highest of any shown in the city service, being very much higher than the next highest, that of the Street Cleaning Department.

RATE OF SERVICE RETIREMENT

The rate of service retirement, although apparently not as important as the disability retirement in the Police Pension Fund, is nevertheless the second highest among the rates for all funds. The rate is exceeded as a whole to age 65 by the rate for the Fire Department Relief Fund, since police are not eligible for retirement until age 55, while firemen may retire before that age.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

The table on page 51 shows the rates used in the construction of all the pensioners' tables except that for dependents. A diagram showing the rates of mortality plotted on cross-section paper is given on page 52.

DISABILITY PENSIONERS' DEATH RATE

The application of the rate of death for disability pensioners of the 1913 report to the exposure prepared by the Commission gives over 7 per cent. more cases of death than the present experience shows; consequently it seemed advisable to graduate the rate on the basis of the present experience. The rate of mortality for disability pensioners is the lowest used, with the single exception of that applying to women teachers. The rate is noticeably lower than the general invalid mortality rates which were available for comparison from outside sources. When it is recalled that an extraordinary high rate of disability retirement from active service is coupled with this low death rate among disability pensioners there seems to be an indication that many of the employees were retired for slight impairments of health which did not seriously affect their constitutions.

TABLE 13—RATES OF MORTALITY AMONG PENSIONERS— POLICE PENSION FUND

Age	Disability	Service	Age	Disability	Service
20	.2210		60	.0435	.0470
21	.2140		61	.0453	. 0480
22	.2060		62	.0471	.0402
23	.1980		63	.0402	.0508
24	. 1885		64	.0514	.0525
25	.1790		65	.0538	.0544
26	.1687		66	.0562	.0563
27	.1573	• • •	67	.0580	.0592
28	.1452		68	.0618	.0626
29	.1341	• • •	69	.0646	.0664
30	.1239		70	.0675	.0712
31	.1140		71	.0710	.0777
32	.1050		72	.0742	.0850
33	.0967	• • •	73	.0780	.0036
34	.0800	• • •	74	.0810	. 1025
3 5	.0818		75	.0860	.1108
36	.0753		76	.0008	.1188
37	.0605		77	.0955	. 1260
38	.0642		78	.1014	.1340
39	.0592		79	.1079	.1425
40	.0547		80	.1153	.1520
41	.0506		81	.1245	. 1624
42	.0472	•••	82	.1354	.1745
43	.0441	•••	83	.1495	.1900
44	.0418	•••	84	.1655	.2100
45	.0308	•••	85	.1850	. 2400
46	.0382	•••	86	.2100	. 2925
47	.0370	•••	87	.2380	.3700
48	.0362	•••	88	.2740	.4650
49	.0357	•••	89		. 5280
50	.0353	•••	90	.3135 .3575	.5760
51	.0352	•••	91	.4100	.6230
52	.0353	•••	92	.4650	.6650
53	.0358	•••	93	.5300	.7070
5 4	.0350	• • •	94		
55	.0302	0420	95	.6050 .6850	.7500
56		.0429	95		.7930
57	.0379	.0436	97	.7700	.8350 .8800
57 58	.0390	.0444		.8630	
	.0402	.0452	98	.9600	.9240
59	.0419	.0461	II		• • •

SERVICE PENSIONERS' DEATH RATE

The number of deaths among service pensioners, according to the present experience, is about 8 per cent. less than the number obtained by multiplying the rates shown in the 1913 report into the present exposure, consequently a new rate was graduated. The rate for police is the second highest of the nine service pensioners' mortality rates used, being exceeded only by the rate for street cleaners. The rate is higher than the corresponding rate for firemen. Although many of the policemen may take advantage of disability retirement when their health is not seriously impaired, the rate of mortality among service pensioners seems to indicate that the policemen who remain in the service long enough to retire on service pensions have really had their health somewhat impaired by service as they do not live as long as their comrades who claim to have suffered disabilities.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following tables are based on the rates discussed above:

TABLE 14-ACTIVE SERVICE TABLE AND SALARY SCALE

	WITEDRAWALS
Total Performance of Duty	als Total (a)
5,635	<u> </u>
4,474	
-	-
2,300 17	2,300
	2,043
	1,804
	1,029
1,478 20	
*****	1,160
	992
831 26	831
	460
	517
	471
	423
272	27.6
	336
	202
	247
	202
160 24	160
	126
_	.66
_	_
	_

TABLE 14—ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
Police Pension Fund

			WITHDRAWALS			DEATES		SEPARA:	SEPARATIONS BY DISABILITY	ABILITY			
Acs	Living	Resignations	Dismissals	Total	In Performance	Other Causes	Total	In Performance	Other	Total	Service Retirements	Total Decrement	Salary Scale
	(g) (g)	r (a)	& (a) W	w (a)	of Duty s (a) d _s	o (a)	g (g)	of Duty		ê."			w ⁴⁴
ន	30,706	25	So	55	36	443	694	8	2,100	2,105	:	2,629	1,620
51	28,077	*	43	47	21	194	482	4	1,930	1,934	:	2,463	1,629
23	25,614	8	38	1+	1	470	4 8 4	8	1,740	1,743	:	2,268	1,640
S.	23,346	~	35	37	•	465	474	m	1,530	1,533	:	2,044	1,653
\$	21,302	~	30	32	S	450	455	"	1,336	1,338	:	1,825	1,669
55	19,477	-	50	Žz	8	425	428	"	1,131	1,133	3,912	5,500	1,685
26	13,977	-	17	82	H	311	312	H	736	737	1,810	2,877	1,700
57	11,100	:	12	12	:	250	250	н	\$20	521	1,454	2,237	1,713
28	8,863	:	7	7	:	203	203	H	300	367	1,179	1,756	1,721
8	7,107	:	*	4	:	101	101	:	251	251	366	1,417	1,722
8	2,690	:	"	a	:	141	141	:	174	174	854	1,171	1,716
19	4,519	:	H	H	:	120	120	:	611	611	727	296	1,705
70	3,552	:	:	:	:	103	103	:	8	8	800	162	1,000
3:	2,761	:	:	:	:	8	× ×	:	53	53	485	020	1,674
\$	2,135	:	:	:	:	2,	رم	:	34	34	374	484	1,058
2	1,051	:	:	:	:	S	ò	:	21	21	279	305	1,043
8	1,286	:	:	:	:	20	လို	:	13	13	202	271	1,630
20	1,015	:	:	:	:	*	48	:	7	7	144	199	1,618
2	816	:	:	:	:	42	43	:	4	+	107	153	1,607
3	663	:	:	:	:	37	37	:	~	n	87	120	1,598
2	537	:	:	:	:	32	32	:	:	:	21	113	1,589
7	434	:	:	:	:	27	22	:	:	:	83	110	1,581
72	314	:	:	:	:	22	22	:	:	:	88	801	1,573
73	306	:	:	:	:	15	15	:	:	:	77	6	1,565
74	114	:	:	:	:	٥	٥	:	:	:	20	92	1,557
73	4	:	:	:	:	→	4	:	:	:	31	35	1,547
26	11	:	:	:	:	н	H	:	:	:	ខ	11	1,534
77	80	:	:	:	:	:	:	:	:	:	<u>س</u>	8	1,517
9	(_			_				_			7 404

POLICEMEN

TABLE 15—DISABILITY PENSIONERS' MORTALITY TABLE
Police Pension Fund

Age	Living $l_z^{(6)}$	$d_x^{(6)}$	Age	Living l ^(f) s	$d_{\ \boldsymbol{z}}^{(i)}$
20	100,000	22,100	59	2,473	104
21	77,900	16,671	60	2,369	103
22	61,220	12,613	61	2,266	103
23	48,616	9,626	62	2,163	101
24	38,990	7,350	63	2,062	102
25	31,640	5,663	64	1,960	101
26	25,977	4,382	65	1,859	100
27	21,595	3,397	66	1,759	99
28	18,198	2,643	67	1,660	97
29	15,555	2,086	68	1,563	97
30	13,469	1,669	69	1,466	95
31	11,800	1,345	70	1,371	92
32	10,455	1,097	71	1,279	91
33	9,358	905	72	1,188	88
34	8,453	753	73	1,100	86
35	7,700	630	74	1,014	83
36	7,070	532	75	931	· 8o
37	6,538	454	76	851	77
38	6,084	391	77	774	74
39	5,693	337	78	700	71
40	5,356	293	79	629	68
41	5,063	256	80	561	65
42	4,807	227	81	496	61
43	4,580	202	82	435	59
44	4,378	183	83	376	56
45	4,195	167	84	320	53
46	4,028	154	85	267	50
47	3,874	143	86	217	45
48	3,731	135	87	172	41
49	3,596	129	88	131	36
50	3,467	122	89	95	30
51	3,345	118	90	65	23
52	3,227	114	91	42	17
53	3,113	111	92	25	12
54	3,002	109	93	13 6	7
55	2,893	107	94		4
56	2,786	105	95	2	I
57	2,681	105	96	I	I
58	2,576	103	∥ … ¦	•••	• • •

56 SECTION II

TABLE 16—SERVICE PENSIONERS' MORTALITY TABLE
Police Pension Fund

Age	Living (p) s	Dying d (p)	Age	Living (p)	Dying $d_{s}^{(p)}$
55 •	289,322	12,412	76	74,493	8,850
56	276,910	12,073	77	65,643	8,271
57	264,837	11,759	78	57,372	7,688
58	253,078	11,439	79	49,684	7,080
59	241,639	11,140	80	42,604	6,476
60	230,499	10,833	81	36,128	5,867
61	219,666	10,544	82	30,261	5,281
62	209,122	10,289	83	24,980	4,746
63	198,833	10,101	84	20,234	4,249
64	188,732	9,908	85	15,985	3,836
65	178,824	9,728	86	12,149	3,554
66	169,096	9,520	87	8,595	3,180
67	159,576	9,447	88	5,415	2,518
68	150,129	9,398	89	2,897	1,530
69	140,731	9,345	90	1,367	787
70	131,386	9,355	91	580	361
71	122,031	9,482	92	219	146
72	112,549	9,567	93	73	52
73	102,982	9,639	94	21	16
74	93,343	9,568	95	5	4
75	83,775	9,282	96	5 I	4

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table is based on an assumed entrance salary of \$1,000 and shows the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 41. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary:

TABLE 17—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS THEIR FAMILIES, BASED ON AN ENTRANCE SALARY OF \$1,000 FOR VALUES DETERMINED BY SALARY AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS, PAYABLE TO THESE MEMBERS AND AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY

Pensions to	Dependent Parents of Members	Dying in Performance of Duty	ക കൈ വ പ ല ല
z	8	Members Dying While on Pension	12 13 11 7
O CHILDRE	MBERS	From Ordinary Causes	#10 11 9 7
PENSIONS TO CHILDREN	OF MEMBERS DYING IN SERVICE	While in Performance of Duty	нннн Ф
		Total	24 23 19 13
89	ď		\$236 347 426 421 330
PRISIONS TO WIDOWS	MBERS	From Ordinary Causes	\$170 209 206 178 142
PENSIONS	OF MEMBERS DYING IN SERVICE	While in Performance of Duty	\$18 27 31 30 27
		Total	\$424 583 663 629 499
	LITY	Ordinary Causes After First 10 Years Service	\$1,215 1,453 1,472 1,250 720
PENSIONS TO MEMBERS	UPON DISABILITY	In Performance of Duty	\$82 91 77 46 15
ISIONS TO		Total	\$1,297 1,544 1,549 1,296 735
PE	Upon	Service Retire- ment	\$303 368 405 477 612
		Total	\$1,600 1,912 1,954 1,773 1,347
i	Total of All	Pension Benefits	2,046 2,524 2,643 2,424 1,861
	Total Future		\$19,233 17,930 14,470 11,560 9,134
	AGE	ENTRANCE	. 220 830 40 40

* Total Future Salary Estimated without use of "" column, which was used to obtain cost of Service Pension only.

The following table shows the expectations of life of pensioners of various ages, together with the annuity values based on the mortality tables, which were used in valuing pensions:

TABLE 18—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY AND SERVICE PENSIONERS

Police Pension Fund

	AMNUIT	VALUE	EXPECTATI	ON OF LIFE		ANNUIT	Y VALUE	EXPECTATI	ON OF LIFE
AGE	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners	AGE	Disability Pensioners		Disability Pensioners	
20	4.26	•••	5.82		59	0.62	0.22	13.52	12.67
21	4.52		6.33		60	0.40	0.01	13.00	12.25
22	4.82		6.01		61	g. 18	8.79	12.66	11.83
23	5.15		7.57		62	8.95	8.55	12.24	11.41
24	5 - 53		8.32		63	8.73	8.31	11.82	10.97
25	5.95		9.14		64	8.50	8.06	11.40	10.53
26	6.41	• • • •	10.02]	65	8.27	7.80	10.99	10.09
27	6.89	• • • •	10.95		66	8.04	7.52	10.59	9.64
28	7.38	• • •	11.90		67	7.81	7.24	10.19	9.18
29	7.88	• • •	12.84		68	7.58	6.95	9.80	8.73
30	8.36	• • •	13.75	• • • •	69	7 - 34	6.66	9.41	8.28
31	8.83	• • • •	14.63	• • • •	70	7.11	6.36	9.02	7.83
32	9.28		15.45	• • • •	71	6.87	6.06	8.64	7.39
33	9.70		16.20	• • •	72	6.63	5.77	8.26	6.98
34	10.09	• • • •	16.88	• • • •	73	6.39	5.49	7.88	6.58
35	10.45	• • • •	17.48	• • • •	74	6.14	5.23	7.51	6.20
36	10.77	• • • •	17.99	• • •	75	5.89	4.98	7.13	5.86
37	11.05	• • • •	18.42		76	5.64	4 - 74	6.76	5.52
38	11.29	• • •	18.75	• • •	77	5.37	4.50	6.38	5.20
39	11.49	• • • •	19.01	• • • •	78	5.10	4.26	6.00	4.88
40	11.65	• • • •	19.17	• • •	79	4.83	4.01	5.63	4.56
41	11.77	• • • •	19.25	• • • •	80	4 - 55	3.76	5.25	4.23
42	11.84	• • • •	19.25	• • •	81	4.26	3.50	4.86	3.90
43 44	11.88	• • • •	19.18	• • • •	82	3.96	3 · 23	4.48	3.56
45		• • • •	19.04	• • •	83 84	3.66	2.93	4.11	3.20 2.84
46	11.85	• • • •	18.85 18.61			3 · 37	2.63	3 · 74	2.46
47	11.79 11.71	• • • •	18.33	••••	85 86	3.08	2.30 1.06	3 · 39	2.40
48	11.61	• • • •	18.02	••••	87	2.79	1.65	3.04	1.73
49	11.40	• • • •	17.67	••••	88	2.25	1.30	2.41	1.45
50	11.49	• • • •	17.31		89	2.00	1.24	2.13	1.28
51	11.20	:::	16.02	:::	90	1.77	1.12	1.87	1.16
52	11.03	- ::: 1	16.52	:::	91	1.56	1.02	1.64	1.05
53	10.85		16.11	:::	92	1.37	.93	1.43	.06
54	10.67	- :::	15.60		93	1.10	.85	1.23	.87
55	10.47	9.99	15.26	14.24	94	1.02	.76	1.05	.79
56	10.27	0.81	14.83	13.86	95	.87	.67	.80	.70
57	10.06	0.62	14.30	13.47	96	.75	'	.76	
58	9.84	9.43	13.95	13.07	97	.60	1	.61	• • •
	7.24	7.73	-3.73	-37	1		1		

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 19—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Police	Pension	Fred
Ponce	renmon	runa

Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above
22	45	\$45,000	10,783	\$15,169,590	49	140	\$227,950	1,364	\$2,292,830
23	96	96,000	10,738	15,124,590	50	158	274,900		2,064,880
24	245	244,900	10,642	15,028,590	51	167	276,050	1,066	1,789,980
25	328	328,370	10,397	14,783,690	52	169	284,850	899	1,513,930
26	306	306,150	10,069	14,455,320	53	150	248,600	730	1,229,080
27	267	270,100	9,763	14,149,170	54	161	266,190	580	980,480
28	422	488,040	9,496	13,879,070	55	127	217,900	419	714,290
29	537	656,610	9,074	13,391,030	56	91	152,200	292	496,390
30	650	837,960	8,537	12,734,420	57	49	82,150	201	344,190
31	565	729,490	7,887	11,896,460	58	29	49,100	152	262,040
32	526	690,150	7,322	11,166,970	59	25	45,500	123	212,940
33	481	655,230	6,796	10,476,820	60	26	43,200	98	167,440
34	502	705,230	6,315	9,821,590	61	20	37,500	72	124,240
35	474	673,300	5,813	9,116,360	62	II	18,400	52	86,740
36	478	678,500	5,339	8,443,060	63	7	12,140		68,340
37	425	612,100	4,861	7,764,560	64	7	14,950	34	56,200
38	375	543,520	4,436	7,152,460	65	6	8,450	27	41,250
39	360	537,170	4,061	6,608,940	66	4 6	7,700	21	32,800
40	346	537,020	3,701	6,071,770	67	6	9,700		25,100
41	280	443,270	3,355	5,534,750	68	2	2,800		15,400
42	294	466,420	3,075	5,091,480	69	3 1	4,200		12,600
43	236	383,580	2,781	4,625,060	70		1,400		8,400
44	262	428,750	2,545	4,241,480	71	3	4,200	5	7,000
45	247	406,800	2,283	3,812,730	72	1	1,400		2,800
46	265	431,450	2,036	3,405,930	73			I	1,400
47	245	415,700	1,771	2,974,480	74	1	1,400	I	1,400
48	162	265,950	1,526	2,558,780	1	i .	·	1	ι

TABLE 20—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE.

Police Pension Fund

Total Serv- ice Yrs.	Num- ber	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Serv- ice — Yrs.	Num- ber	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	123	\$123,950	10,783	\$15,169,590	16	24	\$39,500	3,038	\$5,120,620
1	1,013	1,014,030	1 '22'	15,045,640	17	366	596,120	3,014	5,090,120
2	625	627,200	9,647	14,031,610	18	765	1,296,170	2,648	4,494,000
3	526	565,590	9,022	13,404,410	19	269	453,250		3,197,830
4	333	403,670		12,838,820	20	185	289,850	1,614	2,744,580
5	524	725,100		12,435,150	21	294	477,450		2,454,730
6	757	1,060,950	7,639	11,710,050	22	166	260,000	1,135	1,977,280
7	901	1,280,370	6,882	10,649,100	23	133	225,200	969	1,717,280
8	350	492,650		9,368,730	24	142	235,700	836	1,492,080
9	758	1,076,000	5,631	8,876,080	25	136	230,400	694	1,256,380
10	294	414,000	4,873	7,800,080	26	140	248,340	558	1,025,980
11	678	982,920	4,579	7,386,080	27	87	154,990	418	777,640
12	357	525,420		6,403,160	28	115	215,200	331	622,650
13	291	432,470	3,544	5,877,740	29	. 37	77,550	216	407,450
14	130	194,650		5,445,270	30)			
15	85	121,000	3,123	5,250,620	&	179	329,900	179	329,900
	<u> </u>	<u> </u>		[over	Ų	l	(<u> </u>

TABLE 21—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE

Police Pension Fund

Age	Number	Pensions	Age	Number	Pensions
25	I	\$400	59	50	\$38,190
26		l	60	39	28,750
27		l II	61	33	24,250
28	2	930	62	32	24,460
29	4	1,670	63	25	17,750
30		2,030	64	24	18,990
31	4 3 5 6 3	810	65	17	13,110
32	5	2,360	66	20	15,010
33	ő	2,820	67	19	13,960
34	3	1,400	68	1 Š	14,340
35	4	2,100	69	16	12,040
36	11	4,540	70	14	10,680
37	9	5,120	71	4	2,650
38	11	4,450	72	5	3,400
39	18	9,370	73	5 6	3,600
40	26	13,720	74		3,380
41	22	13,770	75	4 7 6	7,230
42	27	14,250	76	6	4,150
43	25	16,150	77		2,400
44	47	28,340	78	3 2	800
45	41	28,200	79	2	1,880
46	Šī	33,190	80	• • •	
47	84	58,000	81	• • •	1
48	83	59,300	82	3	1,700
49	63	46,080	83	ĭ	250
50	82	59,190	84	• • •	1
51	101	75,300	85	2	900
52	144	108,660	86		1
53	131	94,860	87	1	1,380
54	127	95,780	88	I	1
55	123	95,480	89	ī	1,000
56	100	78,750	90	• • •	
57	82	58,690			_
58	64	50,810	Total	1,865	\$1,333,761

TABLE 22—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE

Age	Number	Pensions	Age	Number	Pensions
5 5	8	\$6,030	75	23	\$18,180
56	32	25,660	76	14	10,490
57	32 38 38	29,230	77	II	9,040
58	38	32,420	78	10	6,500
59	21	18,080	79	7	4,450
60	32	30,130	80		4,700
61	29	24,330	81	7 6	4,280
62	22	17,820	82	5	4,900
63	25	18,930	83	Í	600
64	37	30,730	84	4	2,800
65	43	34,510	85	4	3,150
66	43	36,540	86	••	
67	60	47,240	87	I	600
68	69	53,080	88	1	600
69	61	47,080	89		1
70	60	44,430	90		
71 ·	48	38,050	91		
72	41	30,590	92	• •	
73	27	23,990			
74	23	17,840	Totals	851	\$677,000

TABLE 23—NUMBER AND PENSIONS OF ALL WIDOW PENSIONERS* CLASSIFIED BY AGE

Police Pension Fund

Age	Number	Pensions	Age	Number	Pensions
25	I	\$600	63	38	\$11,040
26			64	31	9,120
27	I	600	65	35	10,390
28	ī	600	66	31	9,250
29	1 2	1,200	67	28	8,120
30	3 5	1,500	68	31	9,300
31	2	900	69	30	9,000
32	10	3,600	70	31	9,750
33	14	4,260	71	10	5,550
34	ii	3,300	72	28	8,400
35	12	3,600	73	16	4,740
36	15	4,380	74	24	7,020
37	21	6,240	75	12	3,600
38	15	4,350	76	13	3,580
39	28	8,700	77	4	1,200
40	25	7,740	78	10	3,000
41	24	6,900	79		2,730
42	30	8,760	80	9 6	1,800
43	27	8,580	81	2	600
44	33	10,600	82	2 5 5 3 5	1,680
45	51	15,600	83	3	1,500
46	45	14,100	84	3	900
47	43 41	11,880	85	ي ع	1,320
48	48	13,620	86		1,320
49	39	11,520	87	ī	300
50	45	13,500	88	ī	300
51	47	14,100	89	ī	300
52	47	14,700	90	2	600
53	40	12,480	91	_	
54	55	16,320	92	• •	
55	33	10,200	93	••	1
56	34 41	11,880	94	••	1
57	32	9,800	95	••	1
58	30	8,880	96	••	1
59	36	10,800	97	••	1
60	40	11,700	98	••	1
61	46		99	 I	120
62	25	13,520 7,500	"	•	120
	_		Total	1,442	\$434,620

^{*}Includes one dependent parent pensioner.

TABLE 24—NUMBER AND PENSIONS OF ALL CHILDREN PENSIONERS CLASSIFIED BY AGE

Age	Number	Pensions	Age	Number	Pension
1			11	13	\$1,300
2	••	l	12	14	1,950
3	••	1	13	10	990
4	1	\$150	14	II	1,190
5	2	420	15	14	2,770
6	4	430	16	1Ġ	1,500
7	2	150	17	12	1,270
	4	510	18	10	1,140
10	5	440 620	Total	124	\$14,830

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets the complete financial condition of the fund as of that date:

TABLE 25-A VALUATION OF ASSETS AND LIABILITIES OF

Liabilities	
Item	Present Value of Payments to be Made
Pensions to 4,282 Pensioners now on the pension roll of the fund as follows:	
Service Pensioners: 851 annual pensions aggregating	\$ 4,884,437
Disability Pensioners:	
1,865 annual pensions aggregating	13,900,739
1,441 annual pensions aggregating 434,020 Children Pensioners:	4,956,274
124 annual pensions aggregating	62,303
1 annual pension aggregating 600	2,856
Total Pensions Entered Upon	\$23,806,609
Pensions to Dependents of present pensioners:	
Widows' Pensions: Widows of Service Pensioners	\$906,897
Widows of Disability Pensioners	2,530,131
Children of Service Pensioners	8,430 . 68,068
Total Prospective Pensions to Dependents of Present Pensioners	\$3,513,526
Pensions to such Employees as will retire from the present active force of 10,783 employees: Service Pensions	\$12,585,190 586,831 27,034,263
Total Prospective Pensions to Employees	\$40,206,284
Pensions to Dependents of such employees of the present active force as will die in service, or while on pension: Widows' Pensions:	
Widows of employees who will die in Performance of Duty Widows of employees who will die from Other Causes in	\$273,941
widows of employees who will die as Service Pensioners. Widows of employees who will die as Disability Pensioners. Children's Pensions:	3,472,341 1,936,905 4,680,111
Children of employees who will die in Performance of Duty Children of employees who will die from Other Causes in	
service	158,015 33,303
Children of employees who will die as Disability Pensioners Dependent Parents' Pensions: Parents of employees who will die in Performance of Duty	148,573
Total Prospective Pensions to Dependents of employees in service	\$10,739,996
Total Pensions Not Entered Upon	\$54,459,806
Grand Total	\$78,266,415

and liabilities of the Police Pension Fund as of June 30, 1914, and shows

THE POLICE PENSION FUND-VALUED AS OF JUNE 30, 1914

ASSETS Present Value of Payments to be Received Item \$936,650 Contribution of Two Percentum of Future Salaries by Employees..... 3,206,594 *Deficiency. 74,123,171 Grand Total..... \$78,266,415

NOTE—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$6,413,200.

priation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the approthe balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners:

TABLE 26—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

											S	E	C	ΓI	O	N]	Ι																					
Total	\$78,787	66,319	55,537	46,316	38,460	31,810	26.210	21 524	15017	17,027	14,782	11,690	9,459	7,623	6,100	4,874	3,863	3,042	2,383	1,852	1,423	1,076	816	7 00	440	316	220	145	93	8	37	23	14	7	*	a	*		\$3,320 \$34,686,057
Pensions to Dependent Parents	:	:	:	:	:	:	:		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		
Pensions to Children	:	:	:	:	:			:	•	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		\$70,641
Pensions to Widows	\$35,707		27.858			18.506		• •		000'11	688,6	8,325	6,957	5,772	4,755	3,887	3,148	2,526	2,012			156	724	541	399	200	204	137	8	29	37	23	14	7	4		1		\$7,757,170
Disability Pensions	\$43,072	34,698	27,670	21,871	17,136	12.11	10.260	200	0401/	5,959	4,893	3,365	2,502	1,851	1,354	987	715	\$16	371	300	189	125	92	63	41	36	91	∞	8	H	:	:	:	:	:	:	:		\$6,216,731 \$20,610,005 \$7,757,170
Regular or Service Pensions	8	~	:	:	:	:		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		\$6,216,731
*Date	1951	1952	1053	1054	1055	1056	1057	200	1930	1959	000	1961	1962	1963	1964	1965	9961	1961	8961	6961	1970	161	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986		
Years After Valuation			30	\$	41	42	43	: 4	¥	Ç,	\$!	47	84	64	20	51	25	S	\$	22	25	57	88	20	8	5	25	8	\$	65	8	67		69	2		72		Total.
Total	\$2,397,300	2,278,139	2,162,046	2,040,426	1,040,266	1.834.025	1.721.208	1,731,002	790,150,1	1,533,005	1,441,204	1,351,068	1,264,016	1,180,253	1,117,571	1,022,236	929,101	861,761	798,522	737,262	679,523	624,863	572,942	\$23,619	476,987	433,044	391,745	353,046	316,801	282,898	251,300	222,042	195,014	170,363	147,881	126,945	109,296	93,184	,
Pensions to Dependent Parents	\$560			300	311	262	218	2,1	2 :	143	114	80 ·	99	9	99	15	9	a	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
Pensions to Children	\$14,235	12,358	10,831	8,060	6,360	5.837	3.030	2,400	40,0	2,035	1,002	1,105	957	543	142	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
Pensions to Widows	\$427,390				369,135	154.823	140.613	200	320,331		298,944		~								174,151	163,252	152,690	142,481	132,644	123,180		_	97,113										
Disability Pensions	\$1,303,624	1,247,594	1,103,638	1,141,418	1,000,884	1.041.344		1000		899,535	553,957					639,298	599,115	559,972	522,44I	484,965	449,213	414,044	381,447	349,519	318,977	289,824	202,000	235,745				-			108,16	76,659	64,289	53,014	
Regular or Service Pensions		605,038	550,000	516,040	473,576	432.650	203, 263	200	333,040	320,223	250,047	255,158	225,728	198,332	172,961	149,611	109,069	93,005	79,148	816'99	50,159	46,967	38,805	31,619	25,300	20,040	15,587	11,902	8,852	6,337	4,303	2,748	1,631	881	428	188	75	27	
*Date	1914	1915	9161	1017	8161	1010	1020	1001	1 2	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	194	1945	1946	1947	1948	1949	1950	
Years After Valuation		_		_	_								1	_			_		-	_				_		_				_					_			_	_

Date year beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund, expressed as a percentage of the employees' salary: TABLE 27—THE RATES OF CONTRIBUTION, EXPRESSED AS PERCENTAGES OF SALARIES, NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE POLICE PENSION FUND

			PENSION 1	TO EMPLOYEES	TERS		PEN	ISION TO	PENSION TO WIDOWS OF		PENS	PENSION TO CHILDREN	HILDREN OF		
				DISAB	DISABILITY PENSION	ASION		Астіч	ACTIVES DYING		·	ACTIVI	ACTIVES DYING		
AGE AT ENTRANCE	Total	Total	Service Pension	Total	In Per- formance of Duty	Other Causes	Total	In Per- formance	Not in Performance of Duty	Pension- ers Dying	Total	In Per- formance	Not in Performance of Duty	Pension-	Pension to Dependent Parents
		(1) +(2) +(3)	3	(2)+(3)	No Limitation (2)	After 10 Years (3)	(4) +(5) +(6)	(4)		9	(6) + (8) + (2)	(£)		6	(10)
20	10.71	8.32	1.57		.43	6.32	2.27	oI.	16.	1.26	oI.	10.	Şo.	40.	.00
7	11.34	8.76	1.66		÷.	6.65	2.45	11.	%	1.38	11.	10.	8.	so.	.03
200	11.99	9.21	1.75		.46	7.8	2.65	.12	1.02	1.51	II.	٠.	so.	s.	.02
20	12.68	6.67	1.84		4 .	7.35	2.86	.13	1.08	1.65	.13	I	8,	8,	.03
25	13.41	10.15	4.9	× × ×	4 :	7.72	3.10	41.	41.1	1.82	13	ē 5	8,8	8,8	٠. و و
36	14.00	11.20	2 2			2 0	2.03	11.	1.26	2 . 2	? <u>1</u>		8	6	§ 6
27	15.83	11.75	2.30		.53	8.03	3.90	61.	1.32	2.39	.15	10.	8	8	80.
90	16.71	12.34	2.45		43.	9.35	4.19	. 20	1.38	2.61	91.	10.	.07	8	.03
56	17.60	12.94	2.62		.54	9.78	4.47	.21	1.43	2.83	.17	٠.	.07	8,	.02
8:	18.44	13.51	8.8	10.71	.53	10.18	4.74	. 33	1.47	3.05	.17	10.	.07	<u>6</u>	.02
31	19.25	14.05	3.80		.52	10.53	5.01	- 34	1.51	3.26	11.	I	70.	8	.02
22.0	19.97	14.54	3.23		.50	10.81	5.23	. 24	1.54	3.45	81.	ō.	.00	0	2
3.5	20.55	14.92	3.49		.47	10.96	5.43	.25	1.57	3.61	8i.	10.	.00	01.	6
*	20.98	15.20	3.79		44.	10.01	5.58	92.	1.59	3.73	81.	10.	.07	01.	.02
35	21.22	15.34	4.12		9	10.82	5.68	.27	9.1	3.81	81.	ō.	.07	01.	0
98	21.23	15.29	4.44		.36	10.49	5.75	82.	1.62	3.85	11.		8	01.	.03
37	20.08	15.01	4.71		.30	10.00	5.77	. 29	1.63	3.85	.17	ö.	8	oi.	9
80	20.56	14.59	4.95		.25	9.39	5.78	. 29	1.65	3.84	91.	ō.	9	8	
66	19.99	14.02	5.16		61.	8.67	5.78	.30	1.66	3.82	91.	ō.	8	8	
?	19.34	13.38	5.34	8.0 40.0	91:	7.88	5.78	.31	1.65	3.82	51.	ō.	8	8	.03
			_	-	_			_		_	-	_	-	-	

Contributions

By EMPLOYEES

No contribution.

By CITY

Indirect Contributions:

Miscellaneous revenues, such as disciplinary and absence deductions from pay of uniformed force; proceeds of sales of departmental property; certain proportions of penalties; license fees; excise moneys; fines; and 45 per cent of tax collected from foreign fire insurance companies on business done in the City of New York.

Direct Contributions:

Certificates of indebtedness to supplement other revenues as required to meet maturing pensions.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rates of death (1) from causes arising in the actual performance of duty, and (2) from other causes

Rates of disability (1) from causes arising in the actual performance of duty, and (2) from other causes

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

Certain other rates applying to the family of employee which are developed fully in section III, page 305, of this report.

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The schedules for employees in the Fire Department were divided into two classes; one including the schedules representing the uniformed force, which is covered by the relief fund; the other including the schedules representing the clerical staff, which is covered by the City of New York Employees' Retirement Fund. The former class only is considered in this section of the report. The schedules for the latter class were further subdivided and included under the various divisions of City of New York Employees' Retirement Fund.

Special methods of handling data

The general methods previously outlined were employed in developing the data to show unadjusted rates and in graduating the unadjusted rates. The extent of the experience is shown in the following tables:

FIREMEN 69

TABLE 28—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Fire Department Relief Fund

ımber Exposed to Risk	 										 			 	 	27,2
tal Number of Separations	 										 			 	 	9
Total Withdrawals	 										 			 	 	2
Resignations	 										 			 	 	
Dismissals	 										 			 	 	1
Total Deaths																
In Performance of Duty																
Other Causes																
Total Separations by Disabili																
In Performance or Duty	 										 			 	 	_
Other Causes	 	• • •	•	• •	•	•	•	 •	• •	• •	 •	•	•	 •	•	
Total Service Retirements.																

TABLE 29-SUMMARY OF EXPOSURE-SALARY.

Fire Department Relief Fund.

Class	Number of Annual Salaries	Total Payroll
Active Members	21,304 817	\$32,204,870 1,477,390
Total	22,121	\$33,682,260

TABLE 30—SUMMARY OF EXPOSURE AND SEPARATIONS— EMPLOYEE PENSIONERS.

Fire Department Relief Fund.

Class	Exposed to Risk	Deaths
Disability Pensioners	1,420 2,859	113 122
Total	4,279	235

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, diagrams are given on pages 72 and 73 showing the rates plotted on cross-section paper.

TABLE 31—RATES OF SEPARATION FROM ACTIVE SERVICE

Fire Department Relief Fund

	RA	RATE OF WITHDRAWAL	VAL		RATE OF DEATH		R	RATE OF DISABILITY		Rate of	
AGE	Resignation	Dismissal	Total	In Performance of Duty	Other Causes	Total	In Performance Of Duty	Other Causes	Total	Service Retirement	Total Rate of Separation
	$rwq_x^{(a)}$	$dwq^{(a)}_x$	$w q_x^{(a)}$	$^{ad}q_x^{(a)}$	od q(a)	d q (a)	$at_Tq_x^{(a)}$	otrq(a)	$^{4r}q_x^{(a)}$	or q.	!
30	.0296	.0074	.0370	1000.	.0033	.0034	:	1100.	1100.	:	.0415
77	.0289	.0073	.0362	.0002	.0033	.0035	:	.0013	.0013	:	0140
77	.0273	.0073	.0346	.0003	.0033	.0036	•	.0015	.0015	:	.0397
33	.0257	.0073	.0330	\$000.	.0033	.0037	:	9100.	9100.	:	.0383
74	.0232	.0072	.0304	.0005	.0033	.0038	:	8100.	8100.	:	.0360
22	.0130	.0072	.0202	9000.	.0034	.0040	1000	6100.	.0020	:	.0262
92	ioio.	1/00.	.0172	.000	.0034	.0041	1000	.0021	.0022	:	.0235
27	9200.	0200.	.0146	6000	.0034	.0043	.000	.0023	.0025	:	.0214
90	.0058	6900.	.0127	0000	.0034	4400.	.000	.0024	.0026	:	7610.
2	.0045	6900	• 110.	1100.	.0034	.0045	.000	.0026	.0028	:	.0187
8	.0036	2900.	.0103	.0012	.0034	9700.	.000	. 0028	.0030	:	6210.
31	.0038	.0065	.0093	.0012	.0034	.0046	2000.	.0030	.0032	:	1/10.
32	.0022	.0063	.0085	.001	.0035	.0047	.0003	.0032	.0035	:	7910.
8	7100.	9900.	.0077	.0013	.0036	.0049	,000 1	.0035	.0039	:	.0165
\$,0014	.0056	.0070	0013	.0036	.0049	2000.	.0037	.0044	:	.oió3
32	1100	.0052	.0063	.0013	.0037	.0050	6 000.	4400	.0053	:	9910.
8	6000°	.0045	.0054	.0013	.0038	.0051	0100	- 0054	4 000.	:	6910.
7.0	.0007	.0020	.0033	.0014	.0038	.0052	1100.	1/00.	.0082	:	7910.
× (000	.0023	.0020	.0014	.0040	.0054	1100.	.000	.0105	:	.0188
9	7 000.	.0022	.0026	4100.	.0041	.0055	1100.	goro.	6110.	:	.0200
3	.003	.0021	.0024	418	.0042	.0056	1186.	6110.	.0130	:	.0210
4	.0002	.0020	.0022	4100.	.0043	.0057	1100.	.0124	.0135	.0058	.0272
42	1000	6100.	.0020	4100.	.0045	.0059	1100.	.0128	.0139	6210.	.0347
4	1000	8100.	6100.	.0013	8400.	1900.	0100	.0130	.0140	.0299	6150.
4	1000	7100.	8100.	.0013	.0050	.0063	8000	.0131	.0139	.0464	₹890.
4 5	:	7100.	7100.	.0012	.0054	9900.	.0005	.0133	.0138	.0564	.0785
\$:	9100.	9100.	.0012	1900.	.0073	\$000.	.or34	.0138	.0640	.0867
		_		_	_		_	-	_	_	

TABLE 31—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued

Fire Department Relief Fund

	Total Rate of Separation		.0928	.0977	1001.	1064	1001.	6211.	3611.	8811.	.1220	.1255	9621.	.1343	.1398	. 1464	. r542	. 1646	.1774	.1934	.2128	. 2375	. 2663	.3066	.3678	.4342	.4820	.7851	1.000
Rate of	Service Retirement	$^{or}q_x^{^{(a)}}$	0690	.0720	.0743	8940.	.0788	8080.	.0828	.0850	.0872	8680.	.0930	5960.	. 1008	0901.	.1123	.1210	.1318	.1450	.1613	.1820	0902	. 2400	. 2930	.3500	.4500	.7500	5096.
TY	Total	$^{c_{T}q_{x}^{(a)}}$.0139	.0141	.0144	.0148	.0152	.0157	.0163	8910.	.0174	6/10.	.0185	.0193	.0201	.0212	.0223	.0235	.0250	.0270	.0296	.0326	.0364	.0412	.0474	.0547	:	:	:
RATE OF DISABILITY	Other Causes	$^{\circ \iota_r}q_x^{(a)}$.0136	.0138	.0142	.0146	.0150	9210.	.0162	.0167	.0173	6210.	.0185	.0193	.0201	.0212	.0222	.0235	.0250	.0270	9620.	.0326	.0364	.0412	.0474	.0547	:	:	:
R	In Performance Of Duty	$at_Tq_x^{(a)}$.0003	.0003	.000	.000	.0003	1000	1000	1000	1000	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Total	$dq_x^{(a)}$.0084	.0102	1210.	.0136	.0147	.0155	1910.	9910.	1/10.	9210.	0810.	. o184	.0188	.0192	7610.	.0201	9020.	.0214	6120.	6220.	.0239	.0254	.0274	.0295	.0320	.0351	.0395
RATE OF DEATH	Other Causes	$^{*}d_{x}^{(a)}$	2,007.	1600	1110.	7210.	.0140	.or49	.0157	1 910.	0710.	9/10.	0810.	.0184	.0188	.0192	7610.	.0201	9020.	.0214	6120.	.0229	.0239	.0254	.0274	.0295	.0320	.0351	.0395
	In Performance of Duty	$^{a}d_{x}^{(a)}$.0012	1100.	0100.	6000	.0007	9000	4000.	.0003	1000	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
VAL	Total	$wq_x^{(a)}$.0015	. 0014	.0013	.0012	0100.	6000	2000.	4 000.	.0003	.000	1000	1000	1000	:	:	:	:	:	:	:	:	:	:	:	:	:	:
RATE OF WITEDRAWAL	Dismissal	$\omega_q^{(a)}$.0015	4100.	.0013	2100.	0100.	6000	2000.	4000.	.0003	.000	1000	1000.	1000.	:	:	:	:	:	:	:	:	:	:	:	:	:	:
RAT	Resignation	$rwq_x^{(a)}$:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	AGE		47	\$	\$	တ္တ	51	22	23	\$	22	20	57	80	29	8	19	62	8	\$	92	8	20	8	8	21	נז	7.7	22

BATE

RATES OF RESIGNATION AND DISMISSAL

The rate of resignation for the Fire Department as a whole is the lowest among corresponding rates in the city service, the next higher rate is that applying to policemen.

The rate of dismissal taken as a whole is the lowest of all such rates in the city service.

The total rate of withdrawal, made up of the rates of resignation and dismissal combined, is the lowest of all such rates, being even lower than those for the Supreme Court Pension Funds, the Police Pension Fund and the Teachers' Retirement Fund. That the rate for firemen is low is probably the result of the fact that in this department withdrawal from the service with a pension because of disability is permitted earlier in life and after fewer years of service than is common in the city service. In departments where the limitations upon disability retirement are more stringent, withdrawals from service at the earlier ages occasioned by disability necessarily take the form of resignations without pension. Although the rate of withdrawal in the Fire Department Relief Fund is lower than the corresponding rate in the Police Pension Fund, it resembles the rate of that department more closely in its general tendency to decrease than the rate of any other department.

RATE OF DEATH

Two rates of death were required for valuation purposes in the Fire Department, one covering deaths in the actual performance of duty and the other covering deaths from other causes.

The rate of death from actual performance of duty, taken as a whole, is the highest recorded for any of the three departments for which such a rate was derived from actual experience, but lower than that adopted for valuing pensions under the Street Cleaning Relief and Pension Fund. Approximately 14 per cent. of all deaths in the active service of the Fire Department are the result of the actual performance of duty.

The rate of death from causes not connected with the actual performance of duty is the lowest shown by any of the four Departments for which such rates were prepared. A low rate of death from causes not connected with the actual performance of duty is doubtless to be expected because a select group of men is considered whose physical fitness for service has been determined by examination at entrance. Furthermore, the experience reveals a comparatively high rate of disability and of death after retirement because of disability, apparently indicating that the weaker lives, which would have supplied deaths in the active service, under a fund not permitting disability retirements so freely, have, in the case of the Fire Department Relief Fund, withdrawn from the active service as disability pensioners so that their deaths became those of disability pensioners.

The rate of death in the actual performance of duty and the rate of death from other causes form a comparatively light total death rate in active service, the rate ranking about seventh out of eleven such rates for the city service. The only rates which are lower are those for the members of the Supreme Court funds and of the teaching profession. A similar rate of mortality derived from the experience of the Boston Fire Depart-

ment, which was used for comparison, is somewhat lower up to about age 35, where it exceeds the rate of the New York department on account of a higher rate of death in performance of duty. The data which were employed as a basis for the Boston rate, however, were considered as only indicative of that experience, so that the results of the comparisons can hardly be taken as definitely showing an actual difference in this respect; however, the second set of rates corroborates the first.

RATE OF DISABILITY

The rate of disability in performance of duty for the Fire Department ranks third among the four rates prepared covering disability from service causes. The rate is lower than that for policemen or for employees in the Health Department.

The rate of disability from causes other than performance of duty is also third out of four departments for which such rates were computed; the only rate shown as being lower is that for the Health Department.

When the rates for the two classes of disability are combined in a single disability rate, comparison becomes possible with similar rates from eleven other funds. The rate for the uniformed force of the Fire Department then appears very high; higher, in fact, than that for any other fund except those of the Police Department and the Street Cleaning Department. Such a high rate of retirement through disability is doubtless the result of the accident hazard of the fireman's occupation and the provisions of the law permitting retirement because of disability regardless of the shortness of the time the employee may have been in the service. The rate for the Fire Department Relief Fund follows closely the corresponding rate for the Police Pension Fund to about age 38. From ages 40 to 50 the rate shows little increase, a condition which is perhaps the natural result of a large number of service retirements that are made during these ages.

RATE OF SERVICE RETIREMENT

The rate of service retirement for the Fire Department, considered as a whole up to age 65, is the highest of all rates of service retirement applying to the departments of city service. It is peculiarly high from ages 41 to 50. During that period the average uniformed employee of the department completes the required twenty years' service and, as no age limitation is placed upon retirement and as the amount of pension does not necessarily increase with increasing length of service, the average employee, perhaps naturally avails himself immediately of the privilege of taking his pension and adopting a less hazardous occupation. Considering the rates of disability along with the rates of service retirement, we find that the retirement rates of the Fire Department are higher than those of any other department with the single exception of the Police Department.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

The following table shows the rates used in the construction of all the pensioners' tables except that for dependents. A diagram showing the rates of mortality plotted on cross-section paper is given on page 77:

TABLE 32—RATES OF MORTALITY AMONG PENSIONERS

Age	Disability	Service	Age	Disability	Service
20	.4578	• • • • • • • • • • • • • • • • • • • •	61	.0671	.0510
21	.4485	• • •	62	. 0685	.0530
22	.4338		63	.0700	.0545
23	.4150		64	.0713	.0560
24	.3995		65	.0730	.0575
25	.3475		66	.0750	.0590
26	.2750		67	.0772	.0610
27	.2200	• • •	68	.0795	. 0630
28	. 1850		69	.0820	.0653
29	.1600	• • •	70	.0850	.0678
30	. 1417	• • •	71	.0882	.0710
31	. 1278		72	.0920	.0742
32	.1175		73	.0060	.0780
33	.1000	• • •	74	.1000	.0824
34	.1015		75	. 1050	.0877
35	.0952		76	.1105	.0940
36	.0000		77	.1163	. 1020
37	.0858	• • •	78	.1230	.1120
38	.0820		79	. 1300	. 1250
39	.0788		80	. 1382	. 1460
40	.0758	• • •	81	. 1480	.1740
41	.0734	.0087	82	. 1580	. 2070
42	.0712	.0096	83	. 1690	. 2430
43	.0692	.0104	84	. 1815	. 2800
44	.0677	.0112	85	. 1960	.3220
45	.0662	.0123	86	.2120	.3590
46	.0650	.0136	87	. 2310	.3940
47	.0640	.0149	88	.2530	.4300
48	.0632	.0163	89	.2770	.4650
49	.0628	.0180	90	.3075	. 5020
50	.0622	.0200	91	-3475	. 5410
51	.0620	.0223	92	.3925	. 5830
52	.0618	.0248	93	.4450	.6250
53	.0618	.0273	94	.5025	.6700
54	.0619	.0302	95	. 5800	.7160
55	.0622	.0335	96	.6750	. 7680
56	.0627	.0370	97	.7700	.8200
57	.0634	.0402	98	.9750	.8750
58	.0640	.0437	99	1.0000	.9350
59	.0650	.0464	100		1.0000
60	.0660	.0488	ll	l l	

Mora

DISABILITY PENSIONERS' DEATH RATE

The comparatively high rate of mortality among the disability pensioners of the Fire Department Relief Fund offsets the comparatively low rate of mortality in the active force. Those who become disability pensioners in the first ten years of service are probably, as a general rule, actually disabled and consequently have a high mortality rate. Had the experience been larger it would have been advisable to derive rates for groups classified according to the duration of the disability. A comparison of the rates of mortality of pensioners retired from the different branches of the city service because of disability shows that the rate for the Fire Department is the highest of all from the outset to age 28, and that from that age to about age 70 it is exceeded only by the rates for the Street Cleaning Department and the Supreme Court.

SERVICE PENSIONERS' DEATH RATE

The mortality rate of service pensioners of the Fire Department Relief Fund is similar to the corresponding rate for like classes of risks. The service pensioners of the Police Department probably represent about the same type of men, and the rate of mortality applying to them follows closely the one obtaining in the Fire Department. The rate as a whole is somewhat lower than the rate for policemen; it is, however, the third highest rate among the nine rates used.

SERVICE AND MORTALITY TABLES AND SALARY SCALE The following tables are based on the rates discussed above:

TABLE 33—ACTIVE SERVICE TABLE AND SALARY SCALE

Living Resignation Diminants Total Performance change Cuber Total Total Performance change Cuber Total Performance change			•	WITEDRAWALS			DEATHS		SEPARATIONS	Ä	DISABILITY			
1,000,000 1,006	ACE	Living	Resignations	Dismissals	Ī	In Performance of Duty	Other Causes	Total	In Performance of Duty		Total	Service Retirements	Total Decrement	Scale Scale
1,000,000 79,78 36,978 82 3,430 1,000 <th< th=""><th></th><th>$f_x^{(a)}$</th><th>rw(a)</th><th>du (a)</th><th>W(a)</th><th>$a_{d(a)}^{x}$</th><th>o d (a)</th><th>d.(a)</th><th>e(r(a)</th><th>e4r(a)</th><th>₹r(a)</th><th>0 f (a)</th><th></th><th>SE</th></th<>		$f_x^{(a)}$	rw(a)	du (a)	W(a)	$a_{d(a)}^{x}$	o d (a)	d.(a)	e(r(a)	e4r(a)	₹r(a)	0 f (a)		SE
918.542 27,664 7,045 34,709 172 3,321 3,373 1,108 1,198 1,198 39,280 1,088,773 24,696 6,744 2,422 29,100 29,84 1,302 24,709 1,091 20,048 1,091 20,100 20,048 1,092 21,004 21,004 21,0	20	1,000,000	29,600	7,378	36,978	82	3,338	3,420	:	1,060	1,060	:	41,458	626
88.734 25,006 6,724 31,830 364 3,072 3,336 1,333 1,333 1,333 1,334 1,334 1,334 1,334 1,334 1,334 1,334 1,334 1,334 1,334 1,334 1,346 1,440 1,430 1,440	71	958,542	27,664	7,045	34,709	172	3,201	3,373	:	861,1	1,198	:	39,280	931
882,773 32,687 6,422 29,109 39,81 3,256 1,430 1,430 1,430 33,789 33,789 3,268 1,631 1,431 1,431 31,789 33,789 3,268 1,631 1,1430 1,430 1,430 33,789 33,789 1,611 1,611 1,611 1,611 1,141	55	919,262	25,096	6,724	31,820	264	3,072	3,336	:	1,333	1,333	:	36,489	942
848,364 10,004 6,1142 25,836 437 2,268 1,511 1,511 30,015 848,369 10,038 5,872 10,510 3,265 3,265 1,511 1,511 11,511 11,446 1,511 1,511 11,446 11,446 11,611 1,511 11,611	33	882,773	22,687	6,422	29,109	208	2,052	3,250	:	1,430	1,430	:	33,789	974
818,369 10,638 5,87a 10,51c 3,265 17,40 3,265 17,40 3,265 17,71 17,71 17,72 17,73	4	848,984	19,694	6,142	25,836	427	2,841	3,268	:	1,511	1,511	:	30,615	1,030
778,193 8,000 5,662 13,671 3,267 11,681 1,792 1,792 1,792 1,792 1,792 1,793	25	818,369	10,638	5,872	16,510	525	2,740	3,265	26	1,612	1,671	:	21,446	1,105
778,103 5,801 5,474 11,335 673 2,010 3,283 139 1,774 1,913 1,6531 16,531	56	796,923	8,000	2,662	13,671	200	2,671	3,267	111	189'1	1,792	:	18,730	1,164
761,662 4,387 5,290 9,677 746 2,559 3,305 148 1,851 1,999 14,981 746,681 3,383 5,107 799 2,530 3,305 152 1,099 13,114 734,681 3,490 7,698 835 2,530 3,341 159 2,101 13,910 734,647 2,030 4,678 864 2,481 3,352 201 2,106 2,137 719,647 2,030 4,678 3,341 171 2,106 2,337 11,395 684,627 1,506 4,754 903 2,481 3,378 201 2,478 11,395 684,637 4,754 903 2,481 3,379 202 2,478 11,395 684,636 3,503 904 2,481 3,382 2,406 2,478 11,395 684,646 3,498 3,498 3,490 3,400 704 4,606 2,478 11,395 61,586	27	778,193	2,861	5,474	11,335	673	2,610	3,283	139	1,774	1,913	:	16,531	1,230
746,681 3,383 5,107 8,490 7,530 3,329 15,24 1,949 2,101 13,920 733,761 2,639 4,909 7,548 835 2,506 3,345 171 3,106 2,225 13,114 713,474 2,639 4,900 7,548 864 2,468 3,345 171 2,066 2,225 13,114 707,258 1,556 4,420 5,976 884 2,481 3,345 171 2,476 11,395 695,452 1,196 4,133 5,329 897 2,481 3,378 206 2,688 11,395 694,627 951 3,496 4,138 904 2,481 3,379 2,496 2,488 11,395 67,686 5,600 3,500 3,400 7,448 3,572 11,195 67,686 5,600 3,500 3,400 7,449 11,195 67,444 4,500 3,500 4,449 11,195 67,444 </th <th>8</th> <th>761,662</th> <th>4,387</th> <th>5,290</th> <th>6,677</th> <th>746</th> <th>2,559</th> <th>3,305</th> <th>148</th> <th>1,851</th> <th>1,999</th> <th>:</th> <th>14,981</th> <th>1,270</th>	8	761,662	4,387	5,290	6,677	746	2,559	3,305	148	1,851	1,999	:	14,981	1,270
73a,701 2,639 4,909 7,548 835 2,506 3,341 159 2,006 2,225	50	746,681	3,383	5,107	8,490	799	2,530	3,329	152	I,949	2,101	:	13,920	1,310
719,647 2,029 4,678 6,707 864 2,481 3,345 171 2,166 2,337 12,389 707,258 1,556 4,420 5,976 884 2,468 3,378 201 2,478 11,395 684,672 1,516 4,734 903 2,476 3,378 2,688 11,395 684,677 1,518 904 2,481 3,378 2,638 11,395 684,677 9,498 4,754 903 2,476 3,373 3,649 11,395 671,686 589 3,004 2,500 3,400 676 3,573 4,249 11,195 650,444 4,55 1,674 2,38 883 2,517 3,422 704 4,605 5,39 11,195 625,444 4,55 1,674 2,38 883 2,517 3,422 704 4,605 5,39 11,195 <tr< th=""><th>စ္တ</th><th>732,761</th><th>2,639</th><th>4,909</th><th>7,548</th><th>835</th><th>2,506</th><th>3,34I</th><th>159</th><th>2,066</th><th>2,225</th><th>:</th><th>13,114</th><th>1,344</th></tr<>	စ္တ	732,761	2,639	4,909	7,548	835	2,506	3,34I	159	2,066	2,225	:	13,114	1,344
707,358 1,556 4,420 5,976 884 2,468 3,353 201 2,478 1,806 695,452 1,196 4,133 5,339 897 2,481 3,379 282 2,406 2,688 11,395 684,557 1,196 4,138 904 2,481 3,379 505 2,508 11,395 671,686 589 3,004 3,500 3,400 5,400 11,376 11,376 661,686 589 3,004 3,500 3,400 676 3,573 4,449 11,376 661,686 589 3,004 2,500 3,400 704 4,605 5,309 11,376 650,444 455 1,674 2,500 3,400 704 4,605 5,309 11,342 650,444 455 1,674 2,838 3,422 715 5,980 6,605 11,342 615,110 1,861 1,836 3,422 715 5,980	31	719,647	2,029	4,678	6,707	864	2,481	3,345	1/1	2,166	2,337	:	12,389	1,374
695.452 1,196 4,133 5,329 897 2,481 3,378 2,820 2,088 11,395 694,657 951 3,603 4,1754 903 2,481 3,379 505 2,538 11,176 674,686 580 3,004 3,593 900 2,500 3,400 704 4,403 5,309 11,176 650,444 455 1,674 2,129 892 2,517 3,409 704 4,605 5,309 11,447 650,444 455 1,674 2,139 802 2,517 3,409 704 4,605 5,309 11,447 650,444 455 1,674 2,517 3,409 704 4,605 5,309 11,447 650,444 455 1,673 883 2,517 3,409 704 4,605 5,309 11,447 620,444 456 883 2,517 3,423	22	707,258	1,556	4,420	2,976	884	2,468	3,352	201	2,277	2,478	:	908,11	1,401
084,057 951 3,803 4,754 903 2,470 3,379 505 2,538 3,043 11,170 074,881 740 3,498 4,438 904 2,481 3,373 2,947 3,572 11,195 601,686 3,504 3,593 904 2,500 3,400 704 4,605 5,373 11,195 650,444 455 1,613 863 2,517 3,409 704 4,605 5,309 11,955 627,647 2,51 3,422 715 5,980 6,065 11,955 627,647 3,433 715 6,766 7,477 12,523 627,647 3,433 715 6,766 7,477 12,523 627,648 1,379 3,437 6,766 7,477 12,523 607,119 1,181 789 2,580 3,427 6,766 7,447	E .	695,452	1,196	4,133	5,329	897	2,48I	3,378	282	2,406	2,688	:	11,395	1,427
672,881 740 3,498 4,238 904 2,481 3,385 625 2,947 3,573 11,195 661,686 589 3,604 3,500 3,500 3,500 3,573 4,249 11,195 650,444 455 1,674 3,139 900 3,500 704 4,249 11,442 639,597 345 1,613 865 3,577 3,429 704 4,249 11,942 11,947 639,597 345 1,613 865 3,567 3,423 715 6,766 7,477 11,955 621,119 1,85 1,425 846 2,560 3,426 6,766 7,477 12,527 602,133 1,31 1,485 81,56 3,427 67 7,485 8,156 12,527 3,493 16,395 602,133 1,10 1,016 1,016 1,016 7,485 8,114 7,487 8,	46	684,057	951	3,803	4,754	903	2,476	3,379	505	2,538	3,043	:	11,176	1,408
001,086 589 3,504 3,500 3,500 3,600 070 3,573 4,249 11,242 650,444 455 1,674 2,139 2,517 3,400 704 4,605 5,309 10,847 639,597 1,674 2,139 2,539 1,605 1,1955 10,847 639,597 1,475 866 2,567 3,423 711 6,695 11,955 621,139 186 2,567 3,423 711 6,766 7,477 12,886 602,433 132 1,423 71 6,766 7,477 12,886 602,433 13,877 607 7,485 8,156 3,493 16,395 585,838 81 1,181 789 2,688 3,427 67 7,487 8,114 7,557 20,279 585,838 81 606 3,427 5,48 3,493 16,91 20,279 585,838	55	672,881	740	3,498	4,238	904	2,481	3,385	625	2,947	3,572	:	11,195	1,493
050,444 455 1,074 2,129 892 2,517 3,409 704 4,005 5,309 10,847 639,597 3,451 1,463 865 2,537 3,422 715 5,980 6,605 11,955 627,642 2,51 1,453 866 2,537 3,423 715 5,980 6,605 11,955 627,642 1,270 1,453 846 2,580 3,427 7,485 8,005 12,886 602,233 132 1,181 789 2,608 3,427 671 7,485 8,114 7,557 20,279 585,539 81 1,181 789 2,638 3,427 671 7,485 8,114 7,557 20,279 585,539 91 1,001 7,047 7,485 8,114 7,557 20,279 585,539 91 1,001 1,001 1,001 1,001 1,001 1,001 1,001 1,	9	001,080	589	3,004	3,593	8,	2,500	3,400	020	3,573	4,249	:	11,242	1,533
039,597 345 1,493 1,838 883 2,539 3,422 715 5,980 0,095 11,955 627,642 251 1,362 1,613 866 2,567 3,433 711 6,766 7,477 12,523 615,119 185 1,370 1,455 846 2,580 3,427 671 7,485 8,156 3,493 16,395 585,539 81 1,100 1,181 789 2,638 3,427 627 7,485 8,156 3,493 16,395 585,539 45 1,016 747 2,688 3,427 627 7,485 8,156 26,395 585,539 45 1,016 747 2,688 3,427 627 7,487 8,186 26,37 51,026 1,016 747 2,688 3,379 418 7,047 7,465 24,882 36,670 499,592 15 814 829 6,696 3,320	37	650,444	455	1,674	2,129	892	2,517	3,409	704	4,605	5,309	:	10,847	1,577
627,042 251 1,352 1,013 866 2,567 3,433 711 0,706 7,477 12,523 605,119 185 1,270 1,455 846 2,580 3,427 607 7,485 8,156 12,523 585,838 81 1,100 1,181 789 2,638 3,427 671 7,487 8,156 16,305 565,559 45 1,016 1,016 747 2,680 3,427 677 7,487 8,116 20,279 565,559 45 1,016 1,061 747 2,680 3,427 673 7,487 8,114 7,557 20,279 565,559 45 1,001 2,680 3,427 553 7,346 7,694 16,010 29,279 536,262 26 91 691 2,688 3,379 418 7,047 7,465 24,882 36,670 499,592 15 81 2,696 3,320 254 6,639	80 (8)	039,597	345	1,493	1,838	883	2,539	3,422	715	5,080	6,695	:	11,955	1,623
OIS,IIQ IBS I,455 846 2,580 3,426 697 7,308 8,005 I2,880 602,233 I3 I,187 I,181 3,608 3,427 671 7,485 8,156 3,493 16,395 585,338 48 I,101 789 3,637 3,427 627 7,487 8,114 7,557 20,279 565,262 26 9,14 691 3,427 553 7,346 7,897 16,305 499,592 15 814 829 624 691 3,320 254 6,639 6,893 28,177 460,373 9 773 732 555 2,814 3,359 182 6,187 6,369 39,424	9	627,642	2 <u>5</u> 1	1,362	1,613	998	2,567	3,433	711	992'9	7,477	:	12,523	1,654
6021-33 13a 1,187 1,519 819 2,608 3,427 671 7,485 8,156 3,493 16,395 \$85,838 81 1,100 1,181 789 2,638 3,427 627 7,487 8,114 7,557 20,279 \$65,559 45 1,001 7,001 7,48 6,114 7,557 20,279 \$65,559 26 1,001 7,047 7,487 8,114 7,557 20,279 \$56,529 26 1,001 7,047 7,489 16,010 20,297 \$56,020 26 3,320 25 2,488 36,670 \$499,592 15 814 829 6,639 6,639 6,893 28,177 \$460,373 9 713 722 555 2,814 3,359 182 6,187 6,369 29,464 39,924	\$	612,119	185	1,270	1,455	846	2,580	3,426	269	7,308	8,00%	:	12,886	1,708
585,838 81 1,100 1,181 789 2,638 3,427 627 7,487 8,114 7,557 20,279 565,559 45 1,016 1,001 7,47 2,680 3,427 553 7,346 1,699 16,910 29,207 530,502 26 1,016 1,001 1,001 2,688 3,370 418 7,047 7,489 16,910 29,207 490,592 15 814 624 2,696 3,370 418 7,047 7,488 36,770 460,373 9 713 722 555 2,814 3,359 182 6,639 29,464 39,924	41	602,233	132	1,187	1,319	819	2,608	3,427	671	7,485	8,156	3,493	16,395	1,745
565,559 45 1,016 1,051 747 2,680 3,427 553 7,346 7,899 16,910 29,297 536,202 26 918 944 691 2,688 3,379 418 7,047 7,465 24,882 36,670 499,592 15 814 829 624 2,696 3,320 254 6,639 6,893 28,177 39,219 460,373 9 713 722 555 2,814 3,369 182 6,187 6,369 29,464 39,924	42	585,838	8I	1,100	1,181	789	2,638	3,427	627	7,487	8,114	7,557	20,279	1,779
536,262 26 918 944 691 2,688 3,379 418 7,047 7,465 24,882 36,670 499,592 15 814 829 624 2,696 3,320 254 6,639 6,893 28,177 39,219 460,373 9 713 722 555 2,814 3,369 182 6,187 6,369 29,464 39,924	43	565,559	45	1,016	1,00,1	747	2,680	3,427	553	7,346	7,899	016,01	29,297	1,812
499,592 15 814 829 624 2,696 3,320 254 6,639 6,893 28,177 39,219 460,373 9 713 722 555 2,814 3,369 182 6,187 6,369 29,464 39,924	4 :	536,262	50	816	944	169	2,688	3,379	418	7,047	7,465	24,882	36,670	1,840
460,373 9 713 722 555 2,814 3,359 182 6,187 6,369 29,464 39,924	45	499,592	15	814	829	624	2,696	3,320	254	6,639	6,893	28,177	39,219	1,870
	ş	460,373	6	713	732	555	2,814	3,369	182	6,187	6,369	29,464	39,924	1,895

TABLE 33—ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

Age Living Resignations Dismissals Total Performance of Dumy Collect Total Performance of Dumy Causes Performance of Dumy Causes Performance of Dumy				WITEDRAWALS			DEATHS		SEPARATIONS BY	П	DISABILITY			
I/60 rw(a) w(a) ad(a) dd(a) d	AGE	Living	Resignations		Total	In Performance of Duty	Other Causes	Total	In Performance of Duty	Other	Total	Service Retirements	Total Decrement	Sciary
420,4440 614 484 3,034 3,518 135 5,774 5,849 29,011 381,457 524 442 3,681 104 5,774 5,849 29,011 381,457 524 442 3,881 104 5,774 4,949 25,574 345,023 366 366 263 3,634 4,107 4,940 25,574 245,043 268 368 109 3,634 4,107 5,940 14,940 245,044 3,871 3,833 3,536 4,306 4,506 23,774 3,540 16,393 245,134 3,871 3,873 3,434 3,533 3,540 16,393 3,540 16,393 14,400 16,393 16,393 16,393 16,393 3,540 16,393 16,393 16,394 16,393 16,394 16,393 16,393 16,393 16,393 16,393 16,394 16,393 16,393 16,394 16,393 16,393 16,393 16,393<		J(8)	710 (G)	4 w(a)	E (G)	a d (a)	o Q (a)	G (B)	a(r(a)	ofr(a)	(g) 4, (g)	07(a)		5
381,457 524 524 414 3,477 3,891 104 5,376 27,465 3 3,477 3,891 104 5,376 3,766 3,766 3,744 4,197 4,197 4,1949 27,465 3 3,444 3,193 4,197 5,94 4,197 4,1949 25,574 3 3,574	47	420,449	:	614	614	484	3,034	3,518	135	5,714	5,849	110,02	38,992	1,920
344,201 442 442 338 3,820 4,158 79 4,990 4,940 25,574 3 3,541 3,534 4,197 5,94 4,197 5,94 4,197 5,94 4,197 5,94 4,197 5,94 4,197 5,94 4,197 5,94 4,197 4,596 4,196 4,196 4,197 4,596 4,196 4,197	₩	381,457	:	524	524	414	3,477	3,891	104	5,272	5,376	27,465	37,256	1,945
309,078 366 366 263 3,934 4,197 59 4,506 4,505 23,737 34,000 3,866 268	\$	344,201	:	443	442	338	3,820	4,158	79	4,870	4,949	25,574	35,123	1,962
245,513 268 199 3,866 4,065 44,57 4,157 4,200 21,766 3,873 3,832 3,832 3,864 19,870 245,914 3,813 3,332 3,549 16,393 21,864 10,870 16,393 <td< th=""><th>S.</th><th>300,078</th><th>:</th><th>366</th><th>366</th><th>263</th><th>3,934</th><th>4,197</th><th>29</th><th>4,506</th><th>4,565</th><th>23,737</th><th>32,865</th><th>1,980</th></td<>	S.	300,078	:	366	366	263	3,934	4,197	29	4,506	4,565	23,737	32,865	1,980
245,914 328 328 3,671 3,813 33 3,832 3,864 19,870 3 19,870 19,870 19,870 19,870 19,870 19,870 19,870 19,870 19,870 19,870 19,870 10,971 19,333 18,642 19,870 16,933 18,642 18,633 3,549 16,933 18,604 16,933 18,604 16,933 18,604 16,933 16,940 16,933 16,940 16	25	276,213	:	268	268	199	3,866	4,065	43	4,157	4,200	21,766	30,299	1,995
130,438	22	245,914	:	228	228	142	3,671	3,813	33	3,832	3,864	19,870	27,775	1,001
193,859 85 85 48 3,155 3,203 15 3,225 3,240 16,393 15 193,859 193,859 19 19 19 190,938 190,938 2,623 7 2,638 2,944 1,13,399 130,479 19 19 19 19 1,248 1,548 2,414 2,419 12,139 130,479 19 19 19 1,548 1,648 1,1978 2,199 130,479 19,786 1,623 1,789 1,789 1,789 130,850 1,623 1,624 1,625 1,602 1,602 1,602 1,648 1,6418 1,418 1,418 1,432 1,432 1,432 1,051 1,051 1,051 1,228 1,133 1,435 1,435 1,051 1,000 1,000 1,486 486 1,235 1,375 1,375 1,038 1,039 1,000 1,000 1,000 1,038 1,038 1,039 1,039 1,030 1,038 1,039 1,039 1,030 1,000 1,038 1,038 1,038 1,039 1,030 1,038 1,038 1,039 1,039 1,030 1,038 1,039 1,030 1,000 1,000 1,039 1,039 1,039 1,039 1,030 1,030 1,000 1,000 1,000 1,030 1,030 1,030 1,030 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031 1,031	8	218,139		156	156	& &	3,424	3,513	23	3,526	3,549	18,062	25,280	2,033
169,938	42	192,859	_	88	85	*	3,155	3,203	15	3,225	3,240	16,393	120,22	2,040
1499.211 32 2,623 2,623 7 2,671 2,678 13,399 130,479 19 19 2,348 2,444 2,414 2,479 12,135 13,399 113,558 10 10 11 2,089 2 2,191 10,958 10,91 10,958 10,958 10,958 10,958 10,958 10,977 1,978 9,909 10,958	22	169,938	_	20	26	16	2,888	2,904	II	2,938	2,949	14,818	20,727	2,045
130,479 19 19 19 2,348 2,348 2,414 2,419 12,135 13,558	26	149,211	:	32	32	:	2,623	2,623	_	2,671	2,678	13,399	18,732	2,050
113,558 11 1 2,089 2,189 2,191 10,958 96,309 6 6 6 6 1,848 1,1948 1,1977 1,978 1,978 1,978 1,978 1,978 1,978 1,978 1,978 1,978 1,978 1,900 1,000 <	27	130,479	:	61	19	:	2,348	2,348	25	2,414	2,419	12,135	16,921	2,055
98,309 6 6 1,848 1,848 1,977 1,978 9,909 94,568 2 1,627 1,627 1,789 1,789 1,789 8,064 1 72,186 1,218 1,228 1,248 1,602 1,789 8,064 1 61,059 1,218 1,228 1,248 1,432	88	113,558	:	11	11	:	2,089	2,089	"	2,189	2,191	10,958	15,249	8,059
84,508 3 2 1,627 1,627 1,789 8,064 1 72,186 1,602 1,789 1,789 1,789 8,064 1 61,059 1,059 1,238 1,432	S (98,309	:	9	9	:	1,848	1,848	+	1,977	8/6'1	606'6	13,741	2,063
72,180 1,418 1,602 1,602 8,107 1 61,059 1,638 1,602 8,107 1 1 1,432 1,432 1,433 1,433 1,133 1,134 1,144	3	84,568	:	~	a	:	1,627	1,627	:	1,789	1,789	8,964	12,382	2,005
61,059 1,228 1,228 1,432 7,388 1,388 1,432 7,438 7,438 7,432 7,442 <t< th=""><th>19</th><th>72,180</th><th>:</th><th>:</th><th>:</th><th>:</th><th>1,418</th><th>1,418</th><th>:</th><th>1,602</th><th>1,602</th><th>8,107</th><th>11,127</th><th>2,065</th></t<>	19	72,180	:	:	:	:	1,418	1,418	:	1,602	1,602	8,107	11,127	2,065
51,011 1,051 1,051 1,275 0,722 41,963 1,133 1,133 1,133 0,084 41,963 1,133 1,133 0,084 26,649 1,000 1,000 5,460 26,649 1,000 1,000 1,000 26,649 1,000 1,000 1,000 16,909 1,000 1,000 1,000 16,336 1,000 1,000 1,000 1,916 1,910 1,010 1,010 1,916 1,010 1,010 1,010 1,916 1,916 1,010 1,010 1,916 1,910 1,910 1,910 1,916 1,910 1,910 1,910 1,916 1,910 1,910 1,910 1,916 1,910 1,910 1,910 1,916 1,910 1,910 1,910 1,916 1,910 1,910 1,910 1,916 1,910 1,910 1,910 1,916 1,910 1,910 1,910 1,910 <th>20</th> <th>61,059</th> <th></th> <th>:</th> <th>:</th> <th>:</th> <th>1,228</th> <th>1,228</th> <th>:</th> <th>1,432</th> <th>1,432</th> <th>7,388</th> <th>10,048</th> <th>2,065</th>	20	61,059		:	:	:	1,228	1,228	:	1,432	1,432	7,388	10,048	2,065
41,903 896 896 1.133 0,084 33,850 741 741 741 609 609 5,460 20,321 609 609 740 740 740 4,186 4,186 4,186 4,186 4,186 4,186 1,196 <th>3</th> <th>110'15</th> <th></th> <th>:</th> <th>:</th> <th>:</th> <th>1,051</th> <th>1,051</th> <th>:</th> <th>1,275</th> <th>1,275</th> <th>6,722</th> <th>9,048</th> <th>2,065</th>	3	110'15		:	:	:	1,051	1,051	:	1,275	1,275	6,722	9,048	2,065
33.850 1,000 1,000 5,460 5	\$	41,963		:	:	:	896	896	:	1,133	1.133	6,084	8,113	2,065
20,049 609 609 608 868 4,851 20,321 486 486 740 7,40 4,186 10,338 379 379 614 614 3,578 10,338 193 193 490 490 490 3,529 3,699 119 119 1,664 1,437 411	3	33,850		:	:	:	741	741	:	1,000	0,1 0,0	2,460	7,201	2,065
20,321 486 486 740 740 4,186 14,900 379 379 379 364 614 3,578 10,338 283 283 383 490 490 3,578 2,287 2,287 2,287 2,587	8	20,049	_	:	:	:	609	609	:	808	808	4,851	6,328	2,065
14,909 379 379 379 5.18 3.578 10.338	29	20,321	:	:	:	:	486	486	:	740	740	4,186	5,412	2,066
10,338 283 283 490 490 3,029 6,536 193 193 357 3,287 3,029 119 1,664 1,916 1,437 411 17 394	8	14,909		:	:	:	379	379	:	614	614	3,578	4,571	2,068
6,536 193 193 193 193 193 194 1,664 1,916 1,437 1,43	6	10,338		:	:	:	283	283	:	490	490	3,029	3,802	2,070
3,099 II9 II9 I,064 I,437 I,916 I,437 I,437 I,417 I,417 I,437 I,417 I,437 I,417 I,437 I,417 I,437 I,417 I,437 I,417 I,437 I,418	2	6,530		:	:	:	193	193	:	357	357	2,287	2,837	2,075
1,910 68 08 1,437 411 17 17 394	7.5	3,099		:	:	:	611	őii	:	:	:	1,004	1,783	2,080
411 17 17 394	7.7	1,916	_	:	:	:	89	89	:	:	:	1,437	1,505	2,085
	23	411	:	:	:	:	17	17	:	:	:	304	411	2,090

TABLE 34—DISABILITY PENSIONERS' MORTALITY TABLE

Fire Department Relief Fund

Age	Living l'(1)	Dying $d_x^{(6)}$	Age	Living $l_x^{(i)}$	Dying $d_x^{(i)}$
20	2,000,000	915,600	59	2,803	182
21	1,084,400	486,353	60	2,621	173
22	598,047	259,403	61	2,448	165
23	338,644	140,537	62	2,283	15 6
24	198,107	79,144	63	2,127	149
25	118,963	41,400	64	1,978	141
26	77,563	21,330	65	1,837	134
27	56,233	12,371	66	1,703	128
28	43,862	8,114	67	1,575	122
29	35,748	5,720	68	1,453	116
30	30,028	4,255	69	1,337	109
31	25,773	3,294	70	1,228	104
32	22,479	2,641	71	1,124	99
33	19,838	2,162	72	1,025	95
34	17,676	1,795	73	930	89
35	15,881	1,511	74	841	84
36	14,370	1,294	75	757	79
37	13,076	1,122	76	678	75
38	11,954	980	77	603	70
39	10,974	864	78	533	66
40	10,110	766	79	467	59 58
41	9,344	686	80	408	58
42	8,658	617	81	350	52
43	8,041	556	82	298	47
44	7,485	507	83	251	42
45	6,978	462	84	209	38
46	6,516	423	85	171	34
47	6,093	390	86	137	29
48	5,703	360	87	108	25
49	5,343	336	88	83	21
50	5,007	311	89	62	17
51	4,696	292	90	45	14
52	4,404	272	91	31	11
53	4,132	255	92	20	8
54	3,877	240	93	12	5
55	3,637	226	94	7	5 4
56	3,411	214	95	3	2
57	3,197	203	96	1	1
58	2,994	191			

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TABLE 35—SERVICE PENSIONERS' MORTALITY TABLE

Fire Department Relief Fund

Age	Living (p)	Dying (p) d z	Age	Living (p)	Dying (F) d _s
41	9,344	82	68	3,797	239
42	9,262	88	69	3,558	232
43	9,174	96	70	3,326	226
44	9,078	102	71	3,100	220
45	8,976	112	72	2,880	214
46	8,864	119	73	2,666	208
47	8,745	130	74	2,458	203
48	8,615	140	75	2,255	198
49	8,475	153	76	2,057	193
50	8,322	166	77	1,864	190
51	8,156	182	78	1,674	187
52	7,974	198	79	1,487	186
53	7,776	212	80	1,301	190
54	7,564	229	81	1,111	193
55	7,335	245	82	918	190
56	7,090	263	83	728	177
57	6,827	273	84	551	154
58	6,554	288	85	397	128
59	6,266	290	86	269	97 68
60	5,976	292	. 87	172	68
61	5,684	290	88	104	45
62	5,394	285	89	59	27
63	5,109	278	90	32	16
64	4,831	271	91	16	9
65	4,560	262	92	7	4
66	4,298	254	93	7 3	2
67	4,044	247	94	İ	I

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table is based on an assumed entrance salary of \$1,000 and shows the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 66. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary.

TABLE 36—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS PAYABLE TO THESE MEMBERS AND THEIR FAMILIES BASED ON AN ENTRANCE SALARY OF \$1,000, FOR VALUES DETERMINED BY SALARY AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY.

Fire Department Relief Fund

PENSIONS TO DEPENDENT	Parents	Of Members Dying in Service	While From in Per-Ordinary formance Causes of Duty	\$8 10 31 8 21 6 18 5	
PENSION			Total	23 4 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1
X		Of Members Dvine	While on Pension	713 19 23 26 28	
PENSIONS TO CHILDREN			From Ordinary Causes	#11 15 16 15 13	
ENSIONS		Of Member Dying in Service	While in Per- formance of Duty	88 8 9 7 73	
ρ.			Total	88 94444 04880	
SA		Of Members Dving	While on Pension	\$304 440 565 696 813	_
PENSIONS TO WIDOWS			From Ordinar Causes	\$155 214 244 254 254	
ENSIONS		Of Members Dying in Service	While in Per- formance of Duty	\$89 128 142 126 91	
-			otal	\$548 782 951 1,076 1,157	
		rdinary	After First 10 Years Service	\$455 517 452 315 185	_
ES	inability	From Ordinary Causes	During First 10 Years Service	\$22 55 123 250 295	_
PENSIONS TO MEMBERS	Upon Disability	I L	formance of Duty	\$34 42 44 45 27	
FIONS T			Total	\$511 614 619 610 507	
PEN		Upon Service Retire-		\$1,607 1,983 1,963 1,824 1,535	-
		Total		\$2,118 2,597 2,582 2,434 2,042	
		Total of All Pension Benefits		\$2,734 3,462 3,610 3,582 3,267	_
		Total Future Salary		\$49,115 18,501 15,320 12,811 9,499	_
		AGE AT ENTRANCE		8888	_

*Total future salary estimated without use of orlz column, which was used to obtain cost of service pension only.

The following table shows the expectations of life of pensioners of various ages, together with the annuity values based on the mortality tables, which were used in valuing pensions.

TABLE 37—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY AND SERVICE PENSIONERS

Fire	Department	Relief	Fund
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	AMMUIT	Y VALUE	EXPECTATI	ON OF LIFE		ANNUIT	Y VALUE	EXPECTATI	ION OF LIPE
AGB	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners	AGE	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners
20	1.73		1.94		58	8.33	9.44	11.37	13.16
21	1.88	• • •	2.15		59	8.19	9.23	11.11	12.74
22	2.09	• • •	2.50	• • • •	60	8.06	9.02	10.85	12.33
23	2.43	• • •	3.02		61	7.91	8.81	10.58	11.94
24	2.92	• • •	3.81	•••	62	7 - 77	8.6r	10.31	11.56
25	3.70	• • •	5.02	• • • •	63	7.61	8.40	10.03	11.17
26	4.60	•••	6.43		64	7.46	8.19	9.75	10.79
27	5.38	• • •	7.68		65	7 · 34	7.98	9.45	10.40
28	6.01	• • •	8.71	• • • •	66	7.12	7 · 75	9.16	10.00
29	6.53	• • •	9.57	• • • •	67	6.92	7.51	8.86	9.60
30 31	6.97	• • •	10.30	••••	68	6.76	7.27	8.57	9.19
32	7.34 7.66	• • • •	10.91	•••	69 70	6.58	7.01	8.27	8.77
33		• • • •	II.44 II.00	•••	71	6.37 6.17	6.74 6.47	7.95	8.35
34	7.93 8.18	• • • •	12.20	•••	72	5.98	6.18	7.04	7.92
35	8.39	•••	12.62	•••	73	5.77	5.88	7.03	7 · 49 7 · 05
36	8.56	• • • •	12.00		74	5.56	5.57	6.72	6.60
37	8.72		13.13		75	5.36	5.25	6.41	6.15
38	8.85		13.31		76	5.13	4.QI	6.10	5.70
39	8.96	• • • •	13.46		77	4.02	4.56	5.80	5.24
40	9.05		13.56		78	4.68	4.21	5.50	4.77
41	0.12	14.55	13.63	24.23	79	4.47	3.84	5.20	4.31
42	0.17	14.24	13.67	23.44	80	4.23	3.47	4.88	3.86
43	0.21	13.93	13.68	22.66	81	4.03	3.11	4.61	3.43
44	9.23	13.61	13.66	21.00	82	3.83	2.79	4.33	3.05
45	9.24	13.20	13.62	21.14	83	3.58	2.50	4.04	2.71
46	9.24	12.97	13.55	20.40	84	3.38	2.25	3.75	2.42
47	9.22	12.65	13.46	19.67	85	3.14	2.03	3.48	2.17
48	9.19	12.32	13.34	18.96	86	2.92	1.85	3.22	1.96
49	9.13	12.00	13.21	18.26	87	2.66	1.70	2.94	1.79
50	9.09	11.68	13.06	17.59	88	2.47	1.56	2.68	1.63
51	8.99	11.36	12.89	16.94	89	2.23	I.44	2.42	1.50
52	8.95	11.05	12.72	16.31	90	2.03	1.30	2.14	1.34
53	8.87	10.76	12.52	15.72	91	1.79	1.17	1.89	1.19
54	8.77	10.46	12.31	15.14	92	1.57	1.03	1.65	1.07
55	8.67	10.19	12.00	14.60	93	I . 37	.75	1.42	.83
56 57	8.56	9.92	11.86	14.09	94	1.00	• • • •	1.07	
3/	8.45	9.68	11.62	13.61	95	∙75	•••	.83	
=					I		<u></u>	<u> </u>	<u> </u>

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 38—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE.

Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above
22	4	\$ 4,000	5,000	\$7,515,390	50	47	\$96,100	321	\$661,100
23	151	151,400	5,005	7,511,390	51	40	85,000	274	565,000
24	122	122,000	4,854	7,359,990	52	42	81,900	234	479,190
25	110	110,400	4,732	7,237,990	53	26	51,200	192	397,290
26	130	142,400	4,622	7,127,590	54	30	64,390	166	346,090
27	261	304,000	4,492	6,985,190	55	30	64,400	136	281,700
28	172	203,200	4,231	6,681,190	56	21	38,200	106	217,300
29	244	314,700	4,059	6,477,990	57	19	42,100	85	179,100
30	230	299,500	3,815	6,163,290	58	7	12,800	66	137,000
31	219	300,200	3,585	5,863,790	59	13	23,000	59	124,200
32	268	377,600	3,366	5,563,590	60	6	15,900	46	101,200
33	257	366,100	3,098	5,185,990	61	12	23,900	40	85,300
34	248	353,400	2,841	4,819,890	62	5	7,700	28	61,400
35	254	382,000	2,593	4,466,490	63	5 6	10,700	23	53,700
36	258	386,200	2,339	4,084,490	64		13,600	18	43,000
37	230	360,300	2,081	3,698,290	65	2	3,900	12	29,400
38	284	454,700	1,851	3,337,990	66	5	10,300	10	25,500
39	194	311,000	1,567	2,883,290	67	I	7,500	5	15,200
40	170	285,200	1,373	2,572,290	68			4	7,700
41	145	252,500	1,203	2,287,090	69	I	1,600	4	7,700
42	143	263,400	1,058	2,034,590	70	I	1,400	3	6,100
43	104	186,100	915	1,771,190	71	I	1,400	2	4,700
44	120	219,700	811	1,585,090	72			I	3,300
45	113	213,400	691	1,365,390	73			I	3,300
46	78	146,900	578	1,151,990	74	1	3,300	1	3,300
47	61	123,000	500	1,005,090	75	• • • •		•••	•••••
48	74	135,700	439	882,090	ll .	1	1	1 :	
49	44	85,200	365	746,390	l		1	1	

TABLE 39—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES, WHO HAVE HAD THE INDICATED SERVICE OR MORE

Fire Department Relief Fund

Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	120	\$129,000	5,000	\$7,515,390	16	95	\$168,300	981	\$1,893,490
1	699	700,800	4,880	7,386,300	17	167	294,100	886	1,725,190
2	108	115,200	4,181	6,685,590	18	146	243,400	719	1,431,090
3	220	285,600	4,073	6,570,390	19	151	283,400	573	1,187,690
4	126	178,500	3,853	6,284,790	20	67	124,800	422	904,290
5	211	298,800	3,727	6,106,290	21	56	113,800	355	779,490
6	214	300,200	3,516	5,807,490	22	36	69,900	299	665,690
7	391	558,900	3,302	5,507,290	23	40	89,9∞	263	595,790
8	293	415,500	2,911	4,948,390	24	29	60,400	223	505,890
9	320	474,800	2,618	4,532,890	25	9	20,000	194	445,490
10	364	557,500	2,298	4,058,090	26	29	63,400	185	425,490
11	325	501,300	1,934	3,500,590	27	16	41,390	156	362,090
12	119	197,100	1,609	2,999,290	28	12	32,300	140	320,700
13	211	373,600	1,490	2,802,190	29	23	48,900	128	288,400
14 15	88 210	150,400 384,700	1,279	2,428,590 2,278,190	30 & over	105	239,500	105	239,500

TABLE 40—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS* CLASSIFIED BY AGE

Fire Department Relief Fund

Age	Number	Pensions	Age	Number	Pensions
30	·2	\$870	58	6	\$4,720
31	1	700	59	3	2,170
32	2	940	60	13	10,310
33	2	870	61	3 13 3 6	2,100
34	2	1,230	62	ŏ	5,350
35	8	5,170	63	2	1,400
36		2,580	64	4	3,150
37	1 7	4,210	65	4 7	4,500
38	5 7 8 6	5,010	66	4	2,650
39		4,070	67	10	7,380
40	16	11,850	68		6,800
41	14	9,900	69	7 6	3,670
42	13	10,320	70	7	5,330
43	10	7,100	71	7 5 7 3 6	3,170
44	14	11,570	72	7	5,050
45 46	9	7,300	73	3	2,230
46	1 7	5,580	74	6	5,580
47	7 8 6 6	6,020	75	4	1,000
48	6	4,300	76	Ś	3,380
49	6	4,400	77	4 5 2 3 2	2,250
50	5 7	3,270	78	3	1,870
51	7	5,310	79		1,550
52	14	11,400	80	2	3,200
53	5	4,350	81	• •	
54	5 3 5 5	2,100	82	• •	
55	5	4,160	83	2	1,680
56	5	4,100	-		
57	8	6,630	Total	317	\$237,800

^{*}Includes 40 partial disability pensioners.

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TABLE 41—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE.

Fire Department Relief Fund

Age	Number	Pensions	Age	Number	Pensions
42	I	\$700	64	13	\$15,700
43	3	3,300	65	17	13,930
44	5	5,150	66	10	10,850
45	10	9,300	67	18	17,370
46	13	17,270	68	16	17,550
47	20	19,300	69	21	18,850
48	18	16,430	li 70	13	12,310
49	24	23,800	71	19	16,690
50	20	18,310	72	11	10,080
51	25	29,480	73	11	8,930
52	27	22,360	74		6,150
53	44	40,550	75	8 8 6	6,100
54	24	23,510	76	6	5,050
55	32	28,080	77	1	2,910
56	19	18,010	78	3 2	1,680
57	15	14,350	79	2	1,780
58	24	21,020	80	2	1,600
59	19	22,230	81	_	1
60	13	13,480	82	••	
61	24	20,240	83	1	600
62	1 8	7,230			!
63	13	14,480	Total	582	\$556,710

TABLE 42—NUMBER AND PENSIONS OF ALL WIDOW PENSIONERS CLASSIFIED BY AGE

Age	Number	Pensions	Age	Number	Pensions
27	4	\$1,200	56	17	\$5,100
28	4	1,900	57	14	4,200
29	4	2,400	58	16	5,900
30	4 5 8	1,900	59	19	6,400
31	8	2,800	60	11	3,300
32	9	3,400	61	20	6,000
33	10	4,800	62	15	5,100
34	15	6,000	63	16	4,800
35	4	1,200	64	30	9,700
36	11	4,100	65	20	6,000
37	7	3,100	66	18	5,800
38	12	4,800	67	12	3,600
39	15	6,300	68	14	4,200
40	20	7,400	69	I 2	3,600
41	17	5,400	70	7	2,800
42	21	7,100	71	9	2,700
43	12	4,700	72	10	3,000
44	12	4,200	73	6	1,800
45	9	3,400	74	6	1,800
46	14	4,200	75	9	2,700
47	17	6,000	76	9 6	1,800
48	20	7,400	77	5	1,500
49	18	6,100	78	••	1
50	19	5,500	79	1	300
51	12	3,600	80	2	600
52	15	5,100	81	2	600
53	18	5,400	82	I	300
54	24	8,500			-
55	15	4,500	Totals	66g	\$226,000

TABLE 43—NUMBER AND PENSIONS OF ALL CHILDREN PENSIONERS CLASSIFIED BY AGE

Fire Department Relief Fund

Age	Number	Pensions	Age	Number	Pensions
1	••	• · · ·	11	2	\$420
2	2	\$220	12	3	320
3	I	150	13	4	1,250
4	2	220	14	15	3,320
5	٠.		15	9	2,420
6	1	150	16	12	2,890
7	2	450	17	4	2,890 850
8	2	170	18	4	750
9 10	5	1,090	Totals	70	\$15,040

TABLE 44—NUMBER AND PENSIONS OF ALL DEPENDENT PARENT PENSIONERS CLASSIFIED BY AGE

Fire Department Relief Fund

Age	Number	Pensions	Age	Number	Pensions
53	2	\$780	74	2	\$650
54	1	300	75	3	1,100
55	ī	400	76	3 2	600
55 56			77	2	600
57			78	••	l
58	2	900	79	I	300
59	ī	180	80	••	
60		1,480	81	2	600
61	5 1	500	82	ī	300
62		300	83	ī	300
63	1 .	600	84	. <u>-</u>	3
64	l . <u>.</u>	1	85	1	300
65	'2	800	86	••	
66	Ī .	1,400	87	••	:::
67	;	1,100	88	••	1
68	4 3 1	300	89	••	1
69	i	500	90		1
70	2	800	91		300
71	2	600		•	1
72	2	600	-		-
73			Totals	48	\$16,290

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets and shows the complete financial condition of the fund as of that date.

TABLE 45—A VALUATION OF ASSETS AND LIABILITIES OF JUNE

	JOHE
Liabilities	
Item	Present Value of Payments to be Made
Pensions to 1,686 Pensioners now on the pension roll of the fund as follows:	
Service Pensioners— 582 annual pensions aggregating\$556,710	\$5,318,769
Disability Pensioners— 277 annual pensions aggregating \$210,180, because of Total	
Disability	1,731,505
Disability	195,623
Widow Pensioners— 669 annual pensions aggregating\$226,000	2,710,946
Children Pensioners— 70 annual pensions aggregating\$15,040	
Dependent Parent Pensioners— 48 annual pensions aggregating	
Total Pensions Entered Upon	\$10,148,906
Pensions to Dependents of present pensioners:	
Widows' Pensions— Widows of Service Pensioners	\$688,116
Widows of Disability Pensioners	189,819
Partia I Disability	37,470
Children of Service Pensioners	15,447
Children of Disability Pensioners	 21,240
Partial Disability	387
Pensioners Pensioners	\$952,488
Pensions to such Employees as will retire from the present active force of	
5,000 employees: Service Pensions	\$20,198,855
Disability Pensions, on account of— Actual Performance of Duty	236,412
Other Causes	187,775
After 10 years' service	4,305,076
Total Prospective Pensions to Employees	\$24,928,118
Pensions to Dependents of such employees of the present active force, as will die in service or while on pension:	
Widows' Pensions— Widows of employees who will die in Performance of Duty	\$535,018
Widows of employees who will die from Other Causes in	1000,
Widows of employees who will die as Service Pensioners	1,250,712
Widows of employees who will die as Disability Pensioners. Children's Pensions—	1,185,312
Children of employees who will die in Performance of Duty. Children of employees who will die from Other Causes in	31,163
service	72,138
Children of employees who will die as Disability Pensioners.	56,649 64,764
Dependent Parents' Pensions— Parents of employees who will die in Performance of Duty.	29,072
Parents of employees who will die from other causes in service	91,254
Total Prospective Pensions to Dependents of Employees in	
Service Total Pensions Not Entered Upon	\$5,544,410 \$31,425,016
Grand Total	\$41,573,022

and liabilities of the Fire Department Relief Fund as of June 30, 1914,

THE FIRE DEPARTMENT RELIEF FUND VALUED AS OF 30, 1914.

Assets	
Item	Present Value of Payments to be Received
Funds in hand	\$850,446
Deficiency.	40,723,476
,	
ļ	
Grand Total	\$41,573,922

^{*}Note—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however will probably be less than \$9,208,200.

until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners by the present value of future pensions to persons now on the roll; that is, present pensioners.

TABLE 46—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

									:	SE	SC.	T	IO	N	. 1	ΙΙ																					
Total	\$37,254	32,186	27,793	24,016	20,769	17,969	15,549	13,452	11,603	9,984	8,563	7,288	6,176	\$,206	4,276	3,623	2,987	2,432	1,959	1,562	1,236	596	742	503	430	8	213	141	8	5	20	7,	•	H		ST4 806 840	Avelocolore
Pensions to Dependent Parents	\$72	52	36	92	91	٥	*	n	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		\$170,716	2.1141
Pensions to Children	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		\$67.111	
Pensions to Widows	\$25,793	23,338	21,035	18,887	16,885	15,027	13,318	11,747	10,306	8,995	7,801	6,720	\$,756	4,898	4,054	3,467	2,879	2,360	116'1	1,531	1,217	954	737	203	420	300	213	141	&	\$4	29	14	•	H		£4 260 800	441309100
Service Penations	\$6,013	4,193	2,821	1,828	1,132	674	386	207	901	52	23	0	3	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		£ 200 007	1,474,401
Disability Pensions	\$5,376	4,603	3,000	3,275	2,736	2,259	1,841	1,496	161'1	937	739	559	417	308	222	156	108	73	84	31	61	11	S	-	:	:	:	:	:	:	:	:	:	:		The Control of the Same of the	42,097,990
*Date	\$1051	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1961	1962	1966	1961	1968	1969	1970	161	1972	1973	1974	1975	1976 I	1077	1978	1979	1980	1981	1982	1983	1984		-	7.01
Year After Valua- tion	37	38	30	\$	4	42	\$	4	5	\$	4	4	\$	8	21	25	S S	3	22	26	22	28	20	8	[0]	62	2	4	65	8	67	8	60	2		È	
Total	\$1,023,458	973,011	922,736	874,082	825,188	776,035	735,675	692,856	650,488	609,747	571,083	533,116	497,759	462,248	428,977	398,184	367,337	339,430	292,897	287,259	275,374	242,749	222,136	202,751	184,478	167,332	151,231	136,132	122,026	108,845	96,622	85,347	75,047	65,664	57,270	49,754	43,090
Pensions to Dependent Parents	\$15,761		13,621	12,001	866'11	11,126	10,292	9,497	8,738	8,013	7,321	6,663	6,040	5,454	4,904	4,393	3,920	3,485	3,082	2,711	2,369	2,059	1,782	1,535	1,315	1,118	942	789	654	537	436	352	282	224	175	134	ά
Pensions to Children	\$14,640	13,372	10,464	8,034	4,732	3,488	3,163	2,741	1,670	1,306	1,137	702	557	555	346	204	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
Pensions to Widows	\$222,736	215,778	208,846	201,037	194,968	188,199	181,379	174,604	167,862	161,189	154,560	148,007	141,431	135,149	128,858	123,483	116,612	110,673	104,873	98,398	93,789	88,312	83,114	78,105	73,214	68,521	966'89	59,65	55,483	51,477	47,658	43,999	40,536	37,228	34,137	31,188	28,407
Service Pensions	\$542,100	518,550	494,757	470,846	446,904	419,497	399,126	375,505	352,164	328,892	306,779	284,892	264,703	243,323	223,818	205,312	187,867	171,488	136,142	141,845	139,049	116,019	104,337	93,396	83,153	73,564	64,614	26,267	48,502	41,329	34,751	28,784	23,447	18,740	14,669	11,208	6,331
Disability Pensions	\$228,131	210,535	195,048	180,364	166,586	153,725	141,715	130,500	120,054	110,347	101,286	92,852	82,028	17,767	120'12	64,792	58,938	53,784	48,800	44,305	40,167	36,359	32,903	29,715	26,796	24,129	21,679	19,425	17,387	15,502	13,777	12,212	10,782	9,472	8,289	7,224	0,253
*Date	1014	1915	9161	101	8161	6161	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1661	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
Year After Valua- tion	0	-	~	က	4	S	9	7	œ	0	2	=======================================	12	13	14	15	16	17	18	61	20	21	22	23	7	22	50	27	78	53	ဓ	31	32	ee :	4	S d	20

Date year beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

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The following table shows the cost of pensions under the present pension fund of the Fire Department, expressed as a percentage of the employee's salary.

TABLE 47—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE FIRE DEPARTMENT RELIEF FUND

	PENSION TO	EMPLOYEES			E	Pension to Widows of	Winows o		Pun	HON TO C	PENSION TO CHILDREN OF		PENSIO	PENSION TO DEPENDENT	THORENT
		DISABILIT	DISABILITY PENSION			ACTIVES DYING	DYING		3	ACTIVES DYING	DYING	<u> </u>		AKKINIB O	
		In Per-	İ	Per-										ACTIVES DYING	Drine
	Service Pension Total	formance of Duty	formance of Duty	ty of	Total		Not in Per-	Penston- ers	Total	In Per- formance	Not in Per-	Pen-	Total		
		No Limita-	With Service of Less	With Service of 10		of Duty	formance of Duty			of Duty	formance of Duty	Dying		In Per- formance of Duty	Other Causes After 10 Years
Ξ	(2)+(3) +(4)		10 Years (3)	or More (4)	(5)+(6) +(7)	(\$)	(9)	(2)	(8)+(9) +(10)	(8)	(6)	(o)	(11)+ (12)	(11)	(13)
-	8.46 2.67	Ĺ	11.	2.38	2.86	.46	18.	1.59	91.	.03	90.	.07	. 20	40.	91.
			41.	2.47	3.01	\$	26.	1.67	.17		8	8	.30	ġ.	9ï.
		61.	81.	2.55	3.19	.52	ė,	1.77	20.	.03	.07	8	. 21	S.	e`
		. 21	.21	2.03	3.44	S,	8	1.92	61.	9	0°	8	.21	ė,	2 i
			.25	2.71	3.79	0.	. o.	7	12.	9	8.9	8	. 22	ė, į	.17
	_	23.	2,50	2,6	62.4	92.	1.10	0.00	2 2	. ģ	8 8	2 1	2 6	3,8	, 9I
		.25	24.	2.05	80.		1.36	2.01	.27	, S	2	.13		8	91.
. A		- 20	.52	2.98	5.45	98.	1.44	3.15	. 28	.os	oi.	.13	. 21	8	.15
		. 28	<u>\$</u>	2.98	5.83	ģ	1.52	3.4I	.30	8,	oi.	14	9	S	.15
<u>.</u>		. 20	&	2.05	0.31	.93	1.59	9.00	.31	8,4	<u>e</u>	51.	<u>0</u>	S.	7 :
_	4.10	 I	8,5	2.00	6.50	è, è	1.07	3.07		8,8	2 :	9 .	01.	6. 9	. I.3
		33	1.4	2,0	7.30	5.6	1.81	19.7	. 3.5	8	::	81	11.	8	.13
		3.5	1.69	2.57	7.80	86.	06.1	5.01	36.	90.	11.	61.	.18	9.	† I.
	12.42 4.76		1.95	2.46	8.39	86.	1.98	5.43	.38	9	.13	8	8 1.	<u>\$</u>	† I.
-	_		2.23	2.34	10.6	66.	8	5.93	•	ė.	.12	. 22	61.	So.	.14
			2.50	2.23	9.70	66.	2.21	6.50	7	s S	.13	- 24	08	S.	SI.
	12.01		2.74	2.13	10.48	6.	2.35	7.14	<u>.</u>	s.	. I.3	200	. 21	S.	e :
-		_	2.94	2.03	11.20	.97	2.40	7.75	04.	S.	. I.3	. 20	. 22	50.	71.
~	5.33		3.11	1.94	12.18	٠ ق	2.00	ø. 50	•	s S	41.	ဇ္	. 23	٠. دور	oI.

TEACHERS' RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Teachers' Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

- (1) Upon application after 30 years' service, provided 15 years of it was in the schools of New York City, a pension, in the discretion of the retirement board, of one-half final salary, with the limitation of a minimum annuity of \$600; a maximum annuity of \$1,500 for teachers and principals, and of \$2,000 for supervising officials.*
- (2) Upon disability occurring after 20 years' service, provided 15 of these years have been served in the schools of New York City, a pension of one-sixtieth of final salary for each year of service, not to exceed one-half final salary.

Contributions

BY EMPLOYEE

One percentum of salary, not to exceed \$30 per annum for teacher or principal; \$40 per annum for supervising official.

By CITY

Indirect contributions:

Miscellaneous revenues, such as net absence deductions from salary roll; 5% of excise moneys.

Direct contributions:

None provided.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death in active service

Rate of disability retirement

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

^{*}The president and professors of Hunter College are entitled to have their annuities increased to multiples of \$1000.

TEACHERS 95

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The schedules for employees of the Department of Education and Hunter College were divided into two classes; one including the teachers and supervising staff who are covered by the Teachers' Retirement Fund, the other including the civil service and janitorial employees who are covered by the City of New York Employees' Retirement Fund. The schedules for the latter class were subdivided and are included under the various divisions of the City of New York Employees' Retirement Fund. The cards for the teachers' fund were subdivided by sex because a difference between the men and women teachers in respect to the mortality and service experience made it necessary to develop tables for each group separately.

The experience of the Hunter College teachers was not included with that of the regular school teachers in determining the rates, because the Hunter College experience is relatively small and involves comparatively small financial liabilities, and yet its inclusion with that of the other teachers might have rendered the rates derived less applicable to the more numerous and financially more important class of regular school teachers. The rates pertaining to the regular school teachers, however, were used in the valuation of pensions for Hunter College teachers, in view of the apparent similarity of the personnel and duties and the fact that they are both subject to the same laws.

The cards for members of the active service of Hunter College were tabulated separately and valued separately, so that the extent of the liability as regards this special group might be individually considered. This liability, however, is not shown separately in the balance sheet given in this report.

Special methods of handling data

The Teachers' Retirement Fund was valued as of June 30, 1912, by Messrs. Hutcheson and Thompson, Actuaries of the Mutual Life Insurance Company of New York City. They developed service and mortality tables at that time based on the experience of the service during a period of five years preceding the date of valuation. The rates developed by these actuaries, as set forth in their report in 1913, were checked into the experience of the funds during the period of observation covered by the Pension Commission and wherever the actual experience had not been very different from that expected by the use of their rates, their rates were adopted. In other cases new rates were developed by the Commission in accordance with the general methods outlined in the first section of this report.*

The general methods previously outlined were employed in developing the data to show unadjusted rates and in graduating the unadjusted rates.

^{*}For detailed discussions of these differences reference may be made to "The Report of the Commission on Pensions on the Teachers' Retirement Fund," which gives a summary comparison of actual and expected cases by use of the former rates.

The extent of the experience of the regular school teachers is shown in the following tables:

TABLE 48—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Teachers' Retirement Fund

	Men	Women
Number Exposed to Risk	13.084.5	98,463.5
Total Number of Separations	13,984.5 364	4,213
Total Withdrawals	243	3,111
Resignations	239	3,102
Dismissals	4	. 0
Total Deaths	5 6	362
Total Separations by Disability	īī	208
Total Service Retirements	54	532

TABLE 49-SUMMARY OF EXPOSURE-SALARY

Teachers' Retirement Fund-Men and Women

Class	Number of Annual Salaries	Total Payroli
Active Members:		
Men	11,413	\$23,808,080
Women	75,643	\$23,808,080 90,929,358
Pensioned Members:		
Men	100	315,540
Women	1,399	2,143,320
Total	88,555	\$117,196,298

TABLE 50—SUMMARY OF EXPOSURE AND SEPARATIONS*— EMPLOYEE PENSIONERS

Teachers' Retirement Fund-Men and Women

Class	Exposed to Risk	Deaths
Disability Pensioners:		
Men	33	1
Women	1,437	40
Service Pensioners:	_	
Men	855 5,885	70 180
Women	5,885	180
Total	8,210	291

^{*} This table includes experience of fund prior to 1908.

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. In the report recently submitted by the Pension Commission on the Teachers' Retirement Fund, no comparisons were made with rates developed from

the experience of the other New York City funds, because when it was prepared these other rates were not available. The present report makes possible comparisons with the rates of other city departments. The comparative rates from other teachers' funds, given in the earlier report, are not repeated, although in some cases reference is made to them.

No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service-men

The following table shows the rates used in constructing the active service table. The active service rates for men are those developed in the report made by Messrs. Hutcheson and Thompson. To visualize the increases and decreases in the rates from age to age and their relative importance at various ages, a diagram is given on page 98 showing the rates plotted on cross section paper.

TABLE 51—RATES OF SEPARATION FROM ACTIVE SERVICE

Teachers' Retirement Fund—Men

Age	Rates of With- drawal	Rates of Death	Rates of Disability Retire- ment	Rates of Service Retire- ment	Age	Rates of With- drawal	Rates of Death	Rates of Disability Retire- ment	Rates of Service Retire- ment
	$^{w}q_{z}^{(a)}$	$dq_x^{(a)}$	*rq(a)	*q(a)		wq (a)	^d q ^(a)	17 q (a)	°7 q (a)
18	.0012	.0000			50	.0020	.0045	.0010	.0041
19	.0047	.0011			51	.0026	.0049	.0010	.0001
20	.0110	.0013			52	.0023	.0053	.0013	.0084
21	.0226	.0014			53	.0020	.0057	8100.	8010.
22	.0271	.0017			54	.0017	.0062	.0023	.0132
23	.0284	.0018			55	.0014	.0070	.0028	.0159
24	.0290	.0020			56	.0012	.0080	.0033	.0185
25	.0291	.0022			57	.0010	.0088	.0038	.0212
26	.0285	.0024			58	.0008	.0096	.0043	.0241
27	.0275	.0026			59	.0005	.0104	.0049	.0274
28	.0262	.0030		• • • •	60	.0003	.0113	.0056	.0313
29	.0237	.0035	•••	• • • •	61	.0001	.0134	.0064	.0360
30	.0216	.0043		• • •	62	• • • •	.0155	.0073	.0413
31	.0195	.0054		• • • • •	63 64	· · · ·	.0180	.0082	.0478
32 33	.0175	.0061	• • • •		65	• • • •	.0208	.0076	.0559
33 34	.0154	.0063			66		.0234	.0070	.0656
3 4 35	.0141		• • • •		67	• • • • • • • • • • • • • • • • • • • •	.0257 .0285	.00/0	.0016
36	.0100	.0059		• • • • •	68		.0318	.0044	.1108
37	.0008	.0050	• • • •		69	• • • • • • • • • • • • • • • • • • • •	.0338	.0022	1326
38	.0087	.0048			70	:::	.0360	.0006	.1680
39	.0080	.0041	.0001	:::	71	:::	.0387		.2075
40	.0073	.0033	.0002		72	:::	.0424	1	.2505
41	.0068	.0032	.0003		73		.0472		. 2980
42	.0063	.0028	.0004		74		.0537	l	.3470
43	.0058	.0028	.0005		75		.0620	١	.3080
44	.0053	.0027	.0006		76	l	.0726		.4510
45	.0050	.0026	.0007		77		.0858		. 5060
46	.0046	.0028	8000.		78		.1020		. 5630
47	.0041	.0033	.0008	.0004	79		.1214		.6240
48	.0037	.0035	.0000	.0014	80		.1445		.6890
49	.0033	.0038	.0009	.0026	81		. 1586	1	.7610
	I		1	l .	11	l	<u> </u>	i	1

RATES OF RESIGNATION AND DISMISSAL

Practically all withdrawals from the active service are reported as resignations, consequently but one rate was developed and no attempt was made to distinguish between resignations and dismissals. The total rate of withdrawal from active service for men ranks eighth among the eleven withdrawal rates developed for New York City funds. The only lower rates are those for the Police, the Supreme Court and the Fire Departments.

Compared with the withdrawal rate for men teachers in the New Zealand teachers' pension fund, the New York rate is slightly higher between the ages of 24 and 31, although it is lower above these ages. The rate of withdrawal among English and Scottish men teachers, according to the report on Elementary School Teachers' Superannuation Fund, 1914, is very much lower throughout than that for New York teachers.

RATE OF DEATH

But one death rate has been used covering all deaths in active service. The rate shows a marked decrease between ages 30 and 45 and is the only death rate showing a decrease with advancing age. The explanation of this condition lies in the fact that the experience for men was not very large and the actuaries did not attempt to graduate out this peculiar result obtained from the data. Although mortality rates obtained from such classes sometimes show a slight decline with advancing age during this period of life, the decrease is ordinarily removed by the graduation.

Taken as a whole the death rate for men teachers is the lowest found in the city service with the single exception of that for members of the College of the City of New York Retirement Fund. Compared with the rate for English and Scottish teachers it is somewhat higher in the earlier ages and lower in the later ages, a condition probably accounted for by the fact that the Scottish teachers may retire if disabled after ten years of service, whereas in New York City the limitation is twenty years.

RATE OF DISABILITY

The rate of disability used for men teachers is the lowest rate for the city service. The rate would seem to indicate that the man school teacher has a healthful occupation and that he does not take advantage of the disability provisions of the retirement law unless his health becomes so impaired that he cannot continue in his profession. When compared with the women teachers' and other disability rates, this rate is found to be very low.

RATE OF SERVICE RETIREMENT

The rate of service retirement, taken as a whole up to age 65, ranks seventh among all rates for the city service, being higher than the rates used for the College of the City of New York, the Street Cleaning Department, and the three classes included in the City of New York Employees' Retirement Fund. The rate indicates that men do not ordinarily take advantage of the retirement provision as soon as they are eligible. If the experience under the disability retirement provision be recalled and considered with the provision, it appears that men teachers prefer to remain in active service rather than to retire on pension.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

The active service—women

The following table shows the rates used in constructing the active service table. The rates of death and withdrawal for women are those developed in the report made by Messrs. Hutcheson and Thompson. To visualize the increases and decreases in the rates from age to age and their relative importance at various ages, a diagram is given on page 101, showing the rates plotted on cross section paper.

TABLE 52—RATES OF SEPARATION FROM ACTIVE SERVICE

Teachers' Retirement Fund—Women

Age	Rates of With- drawal	Rates of Death	Rates of Disability Retire- ment	Rates of Service Retire- ment	Age	Rates of With- drawal	Rates of Death	Rates of Disability Retire- ment	Rates of Service Retire- ment
	wq (a)	$dq_{z}^{(a)}$	47 Q (d)	*rq(a)		$wq_x^{(a)}$	$^dq^{\scriptscriptstyle (a)}_{\ z}$	'rq(a)	of Q z
18	.0025	.0011			49	.0014	.0070	.0106	.0183
19	.0054	.0012			50	.0013	.0075	.0000	.0282
20	.0102	.0013	!		51	.0012	.0080	.008́1	.0370
21	.0175	.0014	1]		52	.0011	.0085	.0077	.0455
22	.0258	.0016	l	• • • •	53	.0010	.0091	.0074	.0520
23	.0455	8100.		• • • •	54	.0010	.0097	.0073	.0578
24	.0581	.0020	l	• • • •	55	.0009	.0104	.0072	.0637
25	.0613	.0023	}	• • • •	56	.0008	.0112	.0071	.0697
26	.0621	.0025		• • • •	57	.0007	.0120	.0071	.0752
27	.0606	.0028		• • • •	58	.0007	.0129	.0071	.0819
28	.0579	.0030		• • • •	59	.0006	.0139	.0071	.0883
29	.0541	.0032	1	• • •	60	.0005	.0150	.0071	.0950
30	.0498	.0033	} ···	• • • •	61	.0004	.0162	.0070	. 1028
31	.0445	.0034	•••	• • • •	62	.0003	.0175	.0070	.1109
32	.0384	.0035		•••	63	.0002	.0189	.0069	. 1 200
33	.0322	.0036		• • • •	64	.0001	.0204	.0068	. 1318
34	.0263	.0036	i	• • • •	65	.0001	.0221	.0065	. 1502
35	.0218	.0036		•••	66	• • •	.0240	.0061	.1745
36 37	.0182	.0037		• • •	67	• • • •	.0260	.0054	. 2040
38	.0152	.0039	.0004	• • • •	68 69	• • •	.0282	.0044	. 2430
39	.0127	.0040	.0016	• • • • •	70	• • • •	.0306	.0030	. 2890
40	.0106	.0042	.0029	• • • •	71	• • • •	.0332	.0001	.3370
41	.0009	.0044	.0064	• • • •	72	• • • •	.0361	• • • •	. 3880
42	.0072	.0040	.0088	•••	73	•••	.0392	• • • •	.4400
43	.0058	.0050	.0103	• • •	74	•••	.0426 .0463	• • • •	. 5040 . 5660
44	.0034	.0053	.0103	• • • •	75	•••	.0503	• • • • •	.6280
45	.0034	.0056	.0113	• • • •	76	• • •	.0503	• • • •	.7000
46	.0027	.0050	.0114	.0003	77	• • • •	.0530	:::	.7820
47	.0012	.0059	.0114	.0053	78		.0737	1	.8790
48	.0015	.0066	.0112	.0112	79		.0/3/		.9860
								1	.,,555

RATES OF RESIGNATION AND DISMISSAL

As practically no dismissals were reported among women school teachers, but one rate of withdrawal was prepared. This rate ranks seventh among all rates of withdrawal, the lower rates being those for men teachers, policemen, Supreme Court employees and firemen. The rate increases rapidly in the earlier ages, reaching a maximum at about age 26, where it is one of the comparatively high rates. Beyond age 26 it decreases very rapidly and although between ages 22 and 41 it is higher than the rate for men teachers, beyond this period it drops considerably below the rate for men. That the rate of withdrawal is at its maximum at about age 25 is obviously the result of the resignations of women teachers who leave the service upon marriage.

Compared with other teachers' withdrawal rates, the rate for New York is below that obtaining in the New Zealand Teachers' Superannuation Fund, and generally below that applying in the Superannuation Fund for English and Scottish Women Teachers, although it exceeds that rate to age 27.

RATE OF DEATH

The death rate as a whole is lower among women teachers than among any other class except men teachers and members of the College of the City of New York Retirement Fund. The death rates for teachers were found to be the lowest existing in the New York City service. The next higher rate is that in the Supreme Court funds. The death rate for women teachers in New York is, however, slightly higher than the rate for women teachers in the English and Scottish Superannuation Fund. This may be partly explained by the fact that the latter fund has a disability provision allowing retirement after ten years of service.

RATE OF DISABILITY

The rate of disability for women teachers ranks about sixth among the ten rates developed for the city service, being lower than the rates for any class of employees whose work demands physical exertion and the highest of the rates for employees whose duties are of a clerical or more or less sedentary character. The rate increases faster than the rate for any other fund from about age 38, the first age at which retirement may take place, and reaches a maximum at age 46, after which it decreases very rapidly. The explanation of the decrease may be in the fact that during this period the teachers are eligible for service pension.

The rate is higher than that for English and Scottish women teachers from about age 38 up to about age 49, although the Scottish teachers have lower limitation on their retirement as regards years of service than the New York teachers.

RATE OF SERVICE RETIREMENT

Up to age 65 the rate of retirement for women school teachers is the third highest of such rates used for the city services, being exceeded only by the rates for the firemen and policemen. This rate, when considered in conjunction with the disability retirement rate, seems to indicate a desire on the part of women teachers to retire as soon as possible. This is

apparently unlike the conditions existing among the men teachers, both in the teachers' fund and the College of the City of New York.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

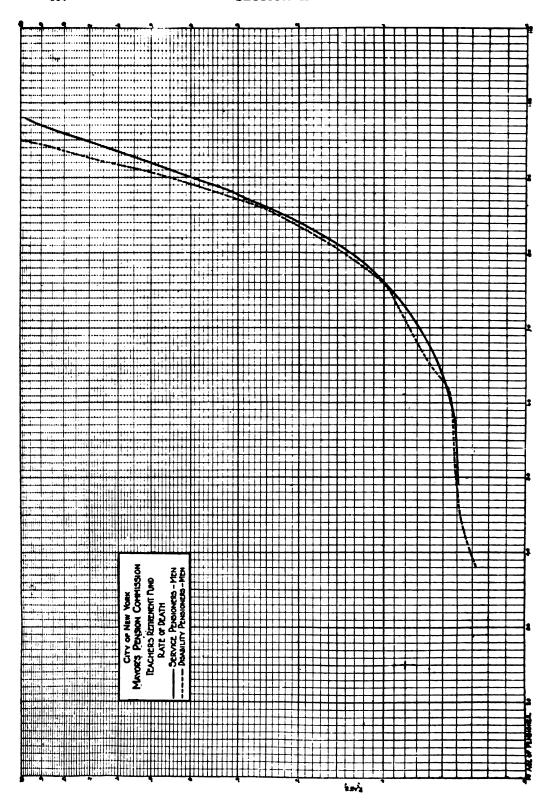
Pensioners-men and women

The following table shows the rates used in the construction of all the pensioners' tables for men and women. Diagrams showing the rates of mortality plotted on cross section paper are given on pages 104 and 105.

TABLE 53—RATES OF MORTALITY AMONG PENSIONERS

Teachers' Retirement Fund

AGE	Dis	BILITY	SER	VICE	AGE	DISAL	ILITY	SERVICE				
	Men	Women	Men	Women		Men	Women	Men	Women			
38	.0280	.0241			70	.0775	. 0633	. 0698	.0436			
39	.0207	.0244			71	.0812	.0671	.0738	.0477			
40	.0313	.0247			72	.0848	.0714	.0778	.0523			
41	.0327	.0250			73	.0882	.0759	.0823	.0573			
42	.0339	.0253	• • •		74	.0014	.0810	. 0875	.0620			
43	.0354	.0257	• • •		75	.0044	. 0866	.0033	.0680			
44	.0367	.0260			76	. 1023	.0030	.0000	.0755			
45	.0382	.0264			77	.1111	, 1000	. 1070	.0826			
46	.0388	.0268	.0385	.0132	78	. 1208	. 1080	.1152	.0002			
47	.0394	.0272	.0387	.0137	79	.1317	. 1165	. 1248	.0088			
48	.0400	.0278	.0389	.0143	80	. 1445	. 1260	. 1358	. 1070			
49	.0405	.0283	.0391	.0148	81	. 1586	. 1370	. 1497	.1177			
50	.0400	.0290	.0393	.0153	82	. 1743	. 1483	. 1647	. 1284			
51	.0412	.0206	.0395	.0150	83	. 1916	. 1605	. 1820	. 1397			
52	.0416	.0302	.0397	.0164	84	.2114	.1725	. 2020	. 1521			
53	.0418	.0311	.0399	.0169	85	. 2356	. 1851	. 2250	. 1652			
54	.0421	.0320	.0402	.0175	86	. 2657	. 1990	. 2525	. 1795			
55	.0423	.0329	.0407	.0181	87	. 3030	.2140	. 2840	. 1947			
56	.0425	.0340	.0411	.0187	88	. 3467	.2200	. 3180	.2110			
57	.0426	.0350	.0418	.0104	89	.3959	. 2450	.3580	. 2284			
58	.0420	.0363	.0426	.0201	90	.4546	. 2630	. 4040	. 2469			
59	.0432	.0377	. 0436	.0200	91	.5325	. 2825	.4560	. 2666			
60	.0436	.0392	.0448	.0218	92	.6343	. 3030	. 5110	. 2876			
61	.0453	.0400	.0460	.0220	93	.7342	. 3240	. 5750	.3098			
62	.0469	.0427	.0476	.0240	94	.8571	. 3465	. 6500	.3332			
63	.0500	.0448	. 0494	.0255	95	1.0000	.3710	. 7340	.3579			
64	.0553	.0467	.0516	.0271	96		. 3970	. 8180	. 3838			
65	.0602	.0488	.0538	.0290	97	• • •	.4250	. 9020	.4108			
66	. 0634	.0513	.0566	.0312	98		.4550	. 9850	.4390			
67	.0667	.0539	.0593	.0337	99		.4880	• • •	.4682			
68	.0700	.0569	.0626	.0366	100		.5240		. 4984			
69	.0738	.0000	. 0660	.0399	ll							



DISABILITY PENSIONERS' DEATH RATE—MEN

As the number of deaths to be expected among the disability pensioners according to the mortality rate derived by Mr. Hutcheson was about the same as the actual number found in the new experience, no change of rate was thought advisable. The rate for men teachers is slightly higher throughout than the rate for women teachers and the rate for disabled policemen, and beyond age 78 it is higher than that of the Fire Department. It is considerably below those of the other city funds. The rate is lower than that of the English and Scottish male teachers up to age 64 and slightly higher beyond.

SERVICE PENSIONERS' DEATH RATE—MEN

The actual number of deaths of service pensioners in the present experience is about 13% less than the expected deaths estimated by the application of Mr. Hutcheson's service pensioners' mortality rates. Because of this difference a new rate was graduated. This new rate, however, was not based on the actual experience recorded by the Commission but is a rate lying between the one found by Mr. Hutcheson and the one indicated by the actual experience reports of the Commission. Both the rate worked by Mr. Hutcheson and that worked by the Commission from actual experience are based on comparatively small numbers. Rather than to accept either one as correct and to reject entirely the other, it seemed safer to take a middle ground, which is doubtless more nearly the true ground, and does not involve so wide a possibility of error. Compared with the rates of the other city funds it ranks about fourth, being lower than that of the Street Cleaning Department, and although about the same as the Fire and Police Departments up to about age 80, it is slightly lower beyond. It is considerably higher than that of the women teachers throughout.

DISABILITY PENSIONERS' DEATH RATE—WOMEN

The mortality rate for women on the disability pensioners' roll is the lowest in the city service. It is lower than that of the English and Scottish women teachers up to age 50 and higher beyond. Beyond age 70 it is practically the same as the English and Scottish men teachers. Not only is the rate lower than any other rate used for the city services but it is lower than the majority of disability rates found in outside experiences, which apparently indicates that many women retire with but minor health impairments.

SERVICE PENSIONERS' DEATH RATE-WOMEN

There was very little difference between the death rates developed from the present and the previous experience, consequently Mr. Hutcheson's rate was adopted. It is the lowest rate used for any city service. It is slightly higher than the rate for English and Scottish women teachers and is also higher than the rate shown in McClintock's Annuity Table for Women.

SERVICE AND MORTALITY TABLE AND SALARY SCALE

The following tables are based on the rates discussed above, with the exception of the salary scales shown in connection with the active service tables. The salary scales were developed directly from the tabulation of employees' salaries.

TABLE 54-ACTIVE SERVICE TABLE AND SALARY SCALE

Teachers' Retirement Fund-Men

												11	2.61		п	C.	C.Z.	•																1,	0,	
Salary Scale 5g	3,085	3,105	3.130	2.146	241	3,100	3,170	3,180	3,190	3,200	3,210	3,220	3,225	3,230	3,235	3,235	3,230	3,230	3,225	3,220	3,210	3,200	3,190	3,180	3,170	3,160	3,145	3,135	3,125	3,105	3,090	:	:	:	:	
Total Decre- ments	940	1,004	1.235	1,202	200	1,552	1,087	1,818	1,948	2,002	2,293	2,484	2,681	2,841	2,965	3,031	3,120	3,174	3,105	3,132	2,999	2,688	2,241	1,703	1,172	720	387	178	- 49	61	4	:	:	:	:	
Service Retirements	460	581	909	810	7 2	726	1,029	1,129	1,234	1,349	1,476	1,599	1,732	1,875	2,014	2,125	2,263	2,392	2,442	2,572	2,527	2,299	1,934	1,475	1,014	620	331	151	26	91	8	:	:	:	:	
Separations by Disability fr(a)	711	04	121	144		102	.154	202	221	241	262	283	297	268	233	194	153	95	41	٥	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
Deaths	82	308	228	000	200	8	425	450	470	489	551	8	652	869	718	713	704	687	623	551	472	389	307	228	158	8	20	27	II	~	н	:	:	:	:	
With- dra wals w(a)	126	108	8	22	• •	8	49	37	23	13	4	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
Living	54.760	53,823	52.720	EL AOA	+ A+ C	50,101	48,549	40,802	45,044	43,096	41,004	38,711	36,227	33,546	30,705	27,740	24,709	21,589	18,415	15,310	12,178	9,179	6,491	4,250	2,547	1,375	655	268	8	23	4	:	:	:	:	
γľ	52	ន	3	5	3	3 8	25	8	8	8	5	62	g	Z	65	8	67	8	8	2	7	72	73	7	75	9/	11	78	2	8	8	82	8	\$	8	_
Salary Scale 52	720	750	707	880		126	1,005	1,105	1,205	1,315	1,420	1,517	1,620	1,720	818,1	016'1	2,000	2,085	2,165	2,240	2,300	2,355	2,410	2,470	2,525	2,570	2,635	2,690	2,760	2,820	2,880	2,935	2,985	3,020	3.055	- ; ;
Total Decre- ments	213	581	1.218	2,256	2000	2,750	2,807	2,790	2,733	2,611	2,469	2,318	2,000	1,945	1,821	1,684	1,510	1,374	1,231	1,081	974	858	763	299	628	276	543	208	486	477	495	246	8	704	812	
Service Retire- ments er(s)	:				:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	23	&	148	231	330	<u>}</u>
Separations by Disability 47(6)	:	:			:	:	:	:	:	:	:	:	;	:	:	:	:	:	:	:	:	:	9	13	81	24	ဇ္ဇ	36	14	47	9	52	Şı	92	92	,
Deaths	8	112	127	171	10	120	601	178	193	201	316	236	270	324	395	436	438	414	390	367	343	306	256	204	194	171	165	157	151	191	188	201	216	254	272	•
With- drawals w(a)	120	460	1.001	2,216	200	2,592	2,038	2,012	2,540	2,410	2,253	2,082	1,829	1,621	1,426	1,248	1,072	96	841	714	631	552	Sor	451	416	381	348	315	294	300	238	213	188	163	145	
Living	100,000	99,787	00.200	02.088	2000	95,032	92,552	90,075	87,285	84,552	81,941	79,472	77,154	75,055	73,110	71,289	69,605	68,095	66,721	65,490	64,400	63,435	62,577	61,814	61,147	60,519	59,943	59,400	58,892	58,406	57,929	57,434	56,888	56,285	54.581	;
8	18	19	8	21	6	4 6	3 :	* 1	32	9	27	78	50	8	31	32	8	#	35	36	37	80 (M	9	\$	4	4	3	‡	4	\$	47	\$	\$	S	21	

TABLE 55-ACTIVE SERVICE TABLE AND SALARY SCALE

Teachers' Retirement Fund-Women

<u> </u>	<u>چ</u>	23	2	75	. I	ድ	55	IC	ጽ	3	2	စ္က	<u> </u>	င္တ	ያ	7.3	32	8	2	စ္က	0.9	× ;	ర్ల	አ	စ္က	55	ž							
Selary Scale Js	1,7	1,7	1,7	1,7	1,7	1,7	1,7	Đ,		8 I	1,820	×	m M	H .	× ×	×0.0	, ,	Ę.	o,	0,1	6,1	Ŏ,	Ę,	<u>,</u>	9,0	0,	9,0	:	:	:	:	-	:	:
Total Decre-	1,992	2,066	2,097	2,101	2,083	2,031	1,985	1,908	1,817	1,724	1,617	1,504	1,399	1,324	1,242	1,137	1,018	803	1,0	484	315	187	95	41	14	4	H	:	:	:	:	:		:
Service Retire- ments or(s)	1,443	1,546	1,599	1,628	1,635	1,607	1,585	1,533	1,468	1,402	1,322	1,236	1,159	1,111	,000 00,000	985	801	773	010	443	289	172	× ×	38	13	4		:	:	:	:			:
Separations by Disability (r(s)	245	220	201	184	167	152	137	123	8	%	83	1,	8	6	37	9	17	* 0	9	:	:	:	:	:	:	:	:	:	:	:	:	:	: :	
Deaths $d_{z}^{(a)}$	269	270	569	300	262	257	249	243	232	221	208	195	179	164	145	120	104	80	80	14,	20	r.S	7	8	н	:	:	:	:	:	:	:	:	
With- drawals w(s)	35	30	- 28 28	23	61	15	14	0	80	'n	4	69	-	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Living (3)	31,720	29,728	23,662	25,565	23,464	21,381	19,350	17,365	15,457	13,640	916'11	10,299	8,795	7,396	0,072	4,830	3,093	2,675	1,812	1,141	057	342	155	8	ô	v	н	:	:	:	:	:	:	:
Age	22	S	\$	55	20	22	28	20	8	5	62	8	B	65	8	20	8	8	2	21	7.7	2:	*	72	9/	7.1	8	2	8	æ	85	8	2	82
Salary Scale 5.5	899	672	189	693	710	733	762	801	850	8	196	1,021	080,1	1,136	1,192	1,250	1,305	1,360	1,400	I,450	1,491	1,529	1,500	1,590	1,613	1,639	1,658	1,679	1,697	1,710	1,720	1,730	1,740	1,750
Total Decre- ments	358	655	1,136	1,851	2,627	4,412	5,347	5,315	2,060	4,641	4,179	3,691	3,226	2,755	2,294	1,870	1,512	1,248	1,049	116	840	798	785	200	826	826	Sos.	786	781	955	1,148	1,361	1,617	1,819
Service Retire- ments or(a)	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	12	203	422	899	166	1,241
Separations by Disability fr(a)	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	61	72	132	198	278	374	432	440	453	450	441	421	386	318	27I
Deaths d'a)	108	117	126	138	150	164	178	189	198	203	207	205	203	961	193	187	182	178	179	181	185	681	193	199	205	210	217	224	232	241	249	256	292	467
With- drawals w(a)	250	538	010,1	1,713	2,477	4,248	5,169	5,126	4,862	4,438	3,972	3,486	3,024	2,559	2,101	1,689	1,330	0,001	870	711	583	477	394	313	247	184	139	801	87	2	20	Sı	94	9
Living l(a)	100,000	99,642	98,987	97,851	000'96	93,373	88,961	83,614	78,299	73,239	68,598	64,419	60,728	57,502	54,747	52,453	50,577	49,065	47,817	40,768	45,857	45,017	44,219	43,434	43,644	41,818	40,992	40,187	39,401	38,620	37,665	36,517	35,156	33,539
										_	_	_			-	_	_		_		_	_				_		_	_			_	_	_

TABLE 56—DISABILITY PENSIONERS' MORTALITY TABLE

Teachers' Retirement Fund-Men

Age	Living (f) l _x	Dying $d_x^{(i)}$	Age	Living $l_x^{(i)}$	Dying $d_{z}^{(i)}$
40	100,000	3,132	68	28,687	2,014
41	96,868	3,168	69	26,673	1,968
42	93,700	3,179	70	24,705	1,914
43	90,521	3,202	71	22,791	1,851
44	87,319	3,206	72	20,940	1,776
45	84,113	3,215	73	19,164	1,690
46	80,898	3,142	74	17,474	1,597
47	77,756	3,063	75	15,877	1,498
48	74,693	2,985	76	14,379	1,471
49	71,708	2,903	77	12,908	1,434
50	68,805	2,813	78	11,474	1,386
51	65,992	2,720	79	10,088	1,329
52	63,272	2,632	80	8,759	1,265
53	60,640	2,534	81	7,494	1,189
54	58,106	2,445	82	6,305	1,000
55	55,661	2,353	83	5,206	996
56	53,308	2,263	84	4,210	890
57	51,045	2,177	85	3,320	782
58	48,868	2,095	86	2,538	674
59	46,773	2,022	87	1,864	565
60	44,751	1,950	88	1,299	450
61	42,801	1,937	89	849	336
62	40,864	1,918	90	513	233
63	38,946	1,983	91	280	149
64	36,963	2,044	92	131	83
65	34,919	2,102	93	48	35
66	32,817	2,080	94	13	II
67	30,737	2,050	95	2	2

TABLE 57-SERVICE PENSIONERS' MORTALITY TABLE

Teachers' Retirement Fund-Men

Age	Living (9) 2	Dying $d \frac{(p)}{z}$	Age	Living l (p) z	Dying d (9)
49	71,708	2,804	74	19,046	1,667
50	68,904	2,708	75	17,379	1,621
51	66,196	2,615	76	15,758	1,574
52	63,581	2,524	77	14,184	1,518
53	61,057	2,436	78	12,666	1,459
54	58,621	2,357	79	11,207	1,399
55	56,264	2,200	80	9,808	1,332
56	53,974	2,218	81	8,476	1,269
57	51,756	2,163	82	7,207	1,187
58	49,593	2,113	83	6,020	1,096
59	47,480	2,070	84	4,924	995
60	45,410	2,034	85	3,929	884
61	43,376	1,995	86	3,045	769
62	41,381	1,970	87	2,276	646
63	39,411	1,947	88	1,630	518
64	37,464	1,933	89	1,112	398
65	35,531	1,912	90	714	288
66	33,619	1,903	91	426	194
67	31,716	1,881	92	232	119
68	29,835	1,868	93	113	65
69	27,967	1,846	94	48	31
70	26,121	1,823	95	17	12
71	24,298	1,793	96	5	4
72	22,505	1,751	97	ī	4 I
73	20,754	1,708			

TABLE 58—DISABILITY PENSIONERS' MORTALITY TABLE

Teachers' Retirement Fund—Women

Age	Living (f)	Dying $d_z^{(i)}$	Age	Living (0)	Dying d (i)
33	100,000	2,590	69	29,791	1,787
34	97,410	2,464	70	28,004	1,773
35	94,946	2,364	71	26,231	1,760
36	92,582	2,259	72	24,471	1,747
37	90,323	2,165	73	22,724	1,725
38	88,158	2,125	74	20,999	1,701
39	86,033	2,000	75	19,298	1,671
40	83,934	2,073	76	17,627	1,639
41	81,861	2,047	77	15,988	1,599
42	79,814	2,019	78	14,389	1,554
43	77,795	1,999	79	12,835	1,495
44	75,796	1,971	80	11,340	1,429
45	73,825	1,949	81	9,911	1,358
46	71,876	1,926	82	8,553	1,268
47	69,950	1,903	83	7,285	1,169
48	68,047	1,892	84	6,116	1,055
49	66,155	1,872	85	5,061	937
50	64,283	1,864	86	4,124	821
51	62,419	1,848	87	3,303	707
52	60,571	1,829	88	2,596	594
53	58,742	1,827	89	2,002	490
54	56,915	1,821	90	1,512	398
55	55,094	1,813	91	1,114	315
56	53,281	1,812	92	799	242
57	51,469	1,801	93	557	180
58	49,668	1,803	94	377	131
59	47,865	1,805	95	246	91
60	46,060	1,806	96	155	62
61	44,254	1,810	97	93	40
62	42,444	1,812	98	53	24
63	40,632	1,820	99	29	14
64	38,812	1,813	100	15	8
65	36,999	1,806	101	7	4
66	35,193	1,805	102	3	2
67	33,388	1,800	103	ī	I
68	31,588	1,797			•••
		·	<u>† </u>		

TABLE 59—SERVICE PENSIONERS' MORTALITY TABLE
Teachers' Retirement Fund—Women

Age	Living loss	Dying d (p)	Age	Living (F)	Dying $d^{(g)}$
45	81,633	1,040	75	36,042	2,483
46	80,593	1,067	76	33,559	2,534
47	79,526	1,003	77	31,025	2,563
48	78,433	1,119	78	28,462	2,573
49	77,314	1,144	79	25,889	2,558
50	76,170	1,168	80	23,331	2,518
51	75,002	1,190	81	20,813	2,450
52	73,812	1,211	82	18,363	2,357
53	72,601	1,231	83	16,006	2,236
54	71,370	1,251	84	13,770	2,094
55	70,119	1,269	85	11,676	1,929
56	68,850	1,200	86	9,747	1,749
57	67,560	1,310	87	7,998	1,557
58	66,250	1,332	88	6,441	1,359
59	64,918	1,357	89	5,082	1,160
60	63,561	1,386	90	3,922	969
61	62,175	1,421	91	2,953	787
62	60,754	1,462	92	2,166	623
63	50,202	1,500	93	1,543	478
64	57,783	1,566	94	1,065	355
65	56,217	1,630	95	710	254
66	54,587	1,703	96	456	175
67	52,884	1,783	97	281	116
68	51,101	1,872	98	165	72
69	40,220	1,965	99	93	44
70	47,264	2,060	100	49	24
71	45,204	2,157	101	25	13
72	43,047	2,250	102	12	7
73	40,797	2,338	103	5	3
74	38,459	2,417	104	2	3 2

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table is based on an assumed entrance salary of \$1,000 and shows the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 94. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary.

TABLE 60—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS AND THE PRESENT VALUE OF THE PENSION BENEFITS PAYABLE TO THESE MEMBERS, BASED ON AN ENTRANCE SALARY OF \$1,000 PER ANNUM FOR MEN AND WOMEN.

Teachers' Retirement Fund

		ME	4	Women							
Age at Entrance	Future Salary	Total of All Pension Benefits	Disability Pension	Service Pension	Future Salary	Total of All Pension Benefits	Disability Pension	Service Pension			
20	\$36,129	\$1,246	\$145	\$1,101	\$19,668	\$1,278	\$278	\$1,000			
25	28,274	1,114	122	992	18,486	1,353	208	1,145			
30	22,993	1,025	104	921	17,398	1,302	112	1,190			
35	19,755	945	86	859	15,370	1,100	53	1,056			
40	17,363	785	54	731	12,645	832	20	812			

The following table shows the expectation of life of pensioners of various ages, together with the annuity values based on the mortality tables which were used in valuing pensions:

TABLE 61—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY AND SERVICE PENSIONERS

The second secon

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

North

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 62—NUMBER AND SALARIES OF ACTIVE MEMBERS'
CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS
SHOWING THE TOTAL NUMBER AND SALARIES OF
EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED
AGE
Teachers' Retirement Fund

AGE		en		MEN	Total Number at Indicated Age	Total Salaries at Indicated Age
	Number	Salaries	Number	Salaries	or Above	or Above
18			ī	\$720	20,588	\$28,890,370
19	:::	• • •	15	10,800	20,587	28,880,650
20	4	\$3,420	167	120,440	20,572	28,878,850
21	12	11,830	458	329,830	20,401	28,754,990
22	26	23,810	811	586,930	19,931	28,413,330
23	51	49,690	962	706,750	10,004	27,802,590
24	72	76,010	907	689,580	18,081	27,046,150
25	88	99,810	979	789,560	17,102	26,279,660
26	88	111,780	874	761,980	16,035	25,390,290
27	128	182,910	774	729,200	15,073	24,516,530
28	118	180,760	78 1	787,000	14,171	23,604,420
29	119	207,860	702	753,980	13,272	22,636,660
30	120	217,940	743	841,080	12,451	21,674,820
31	114	218,480	652	790,320	11,588	20,615,800
32	110	214,910	641	818,980	10,822	19,607,000
33	98	201,890	529	700,520	10,071	18,573,110
34 35	86	187,080	580	826,580	9,444	17,670,700
35 36	98	215,650	538	788,930	8,778	16,657,040
30 37	101	229,220	540	814,980	8,142	15,652,460
37 38	86	246,300 211,010	515 586	808,400	7,501 6,885	14,608,260
39	78	188,440	476	945,850 781,560	6,213	13,553,560
40	71	183,080	478	708,410	5,659	12,396,700 11,426,700
41	78	205,630	424	751,500	5,110	10,445,210
42	84	225,550	400	691,620	4,608	9,488,080
43	62	158,300	337	593,930	4,124	8,570,910
44	68	183,610	360	651,110	3,725	7,818,680
45	60	165,080	314	584,840	3,297	6,983,960
46	61	166,400	285	537,380	2,923	6,234,040
47	41	115,660	247	460,020	2,577	5,530,170
48	26	84,560	233	442,750	2,289	4,954,490
49	42	128,430	220	428,050	2,030	4,427,180
50	26	75,850	174	343,510	1,768	3,870,700
51	27	87,730	176	347,250	1,568	3,451,340
52	34	119,150	131	254,130	1,365	3,016,360
53	27	84,180	144	274,740	1,200	2,643,080
54	27	85,690	165	312,680	1,029	2,284,160
5 5	14	44,100	126	238,950	837	1,885,790
56 57	21	65,550	97	198,610	697	1,602,740
57 58	14	48,670	84	170,920	579 481	1,338,580
59	17	52,900 41,890	51 56	102,370	413	1,118,990 963,720
60	16	48,130	49	104,570	343	817,660
61	15	57,270	57	117,500	278	664,960
62	15	46,350	37	67,460	206	400,100
63	10	36,450	22	43,640	150	376,380
64	12	40,800	32	63,500	127	296,290
65	6	17,600	19	32,510	83	191,990
66	3	9,160	13	21,460	58	141,880
67	2	4,830	l ŏ	20,360	42	111,260
68	6	19,150	5	12,400	31	86,070
69	5 6	15,500	5	10,970	20	54,520
70	1 6	16,900	4	11,150	10	28,050

TABLE 63—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Teachers' Retirement Fund

TOTAL SERVICE	М	EN	Wo	MEN	Total Number of Employees	Total Salaries of Employees Having Indicated Service or More	
YEARS	Number	Salaries	Number	Salaries	Having Indicated Service or More		
0	61	\$69,190	646	\$492,640	20,588	\$28,890,370	
1	90	119,660	1,101	949,950	19,881	28,328,540	
2	133	170,730	1,463	1,144,680	18,600	27,258,930	
3	148	199,700	817	690,940	17,004	25,943,520	
4	152	236,060	1,068	983,540	16,039	25,052,88	
5	130	219,300	715	714,730	14,819	23,833,28	
5 6 7	120	200,930	997	1,069,610	13,974	22,899,25	
7	100	370,570	1,040	1,172,250	12,857	21,628,71	
8	172	344,860	042	1,088,150	11,618	20,085,89	
9	153	326,340	642	776,250	10,504	18,652,88	
10	169	306,000	586	762,060	9,700	17,550,20	
11	155	372,660	776	1,000,580	8,954	16,392,14	
12	Šī	202,350	587	883,000	8,023	14,928,00	
13	111	289,660	762	1,163,120	7,355	13,842,56	
14	91	242,810	518	828,330	6,482	12,380,78	
15	103	280,370	463	743,910	5,873	11,318,64	
16	145	402,700	511	861,550	5,307	10,294,36	
17	64	203,250	471	817,600	4,651	0,030,11	
18	47	135,000	405	682,050	4,116	8,000,26	
19	39	115,410	384	660,200	3,664	7,192,21	
20	38	111,510	289	505,320	3,241	6,416,60	
21	17	58,850	231	407,400	2,914	5,799,77	
22	22	68,010	310	548,500	2,666	5,333,52	
23	21	65,900	207	379,250	2,334	4,717,01	
24	15	46,420	227	400,940	2,106	4,271,86	
25	14	40,310	195	354,740	1,864	3,824,50	
26	18	60,650	162	311,450	1,655	3,429,45	
27	24	80,250	148	283,150	1,475	3,057,35	
28	7	27,050	147	266,250	1,303	2,693,95	
29	14	50,270	130	253,110	1,149	2,400,65	
0 &cover∣	55	207,080	950	1,890,190	1,005	2,007,27	

TABLE 64—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE

Teachers' Retirement Fund

A	м	en	₩o	MIEN		M	EN	Wor	MEN
AGE	Number	Pensions	Number	Pensions	AGE	Number	Pensions	Number	Pensions
39			3	\$2,030	60			4	\$2,320
40	l				61			141	2,410
41			5 8	2,930	62	• • •		6	4,570
42			8	5,090	63	I	\$970	3	2,270
43			13	7,910	64			3 3 5	1,810
44	l		11	6,280	65			5	2,850
45			15	9,850	66			4	2,830
46			16	8,670	67			3	1,590
47	1	\$840	11.	6,170	68	I	610	1 1	-,550
48			19	13,240	69			1 1	
49	2	2,180	15	9,090	70	I	640	1 1	630
50			ıŏ	10,070	71			1 2	1,260
51	l		26	16,670	72		• • •	1 1	630
52			13	7,840	73		• • •	1 1	- 30
53	ī	1,130	14	9,550	74	•••		i	660
54	l	-,-5-	12	6,950	75	•		i	1,000
55	i	1,100	11	7,350	76				590
56		-,	8	5,780	77			;	680
57			5	2,940				1	
58	2	2,490	12	7,130	ll I				
59	ī	1,300	5	2,890	Total	11	\$11,260	278	\$174,530

TABLE 65—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE

Teachers' Retirement Fund

	м	en	Wo	MEN		м	EN	w	DMEN
AGE	Number	Pensions	Number	Pensions	AGE	Number	Pensions	Number	Pensions
48	· ·		I	\$910	71	4	4,630	39	\$30,180
49	l		1	010	72	4	5,160	46	36,270
50	l		3	3,160	73	3	4,080	33	28,380
51	l		13	10,900	74	5	7,000	26	19,570
52	l		22	18,110	75	5	6,180	27	19,910
53	I	\$1,500	23	20,400	76	3	4,900	17	12,220
54	1	1,200	26	19,810	77	3 5	7,700	19	13,420
55	l		36	27,590	78	Ĭ	1,500	13	11,300
56	1	1,200	51	42,600	79	I	1,500	j Š	6.820
57			46	36,220	80	2	2,300	1 7	5,680
58	1	1,200	48	36,000	81	3	3,660	ģ	7,360
59	l		47	34,070	82	2	2,460	3	2,130
60	2	2,700	51	39,480	83	3	9,500	3	2,900
61	2	2,530	62	46,670	84	Ī	1,500	Ĭ	880
62	5.	6,480	65	49,080	85	••	l	٠	
63	2	2,700	51	39,310	86				
64	1	1,200	50	36,990	87	• •			
65	1	800	ĞΙ	47,140	88	• •			
66	4	6,400	64	48,530	89			I	600
67			42	33,410	90			2	1,510
68	3	3,900	54	40,280	91	I	1,500		1
69	3 3	4,000	48	37,210	II I				
70	Ĭ	1,080	42	31,730	Total	71	\$100,460	1,161	\$899,640

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets shows the complete financial condition of the fund as of that date:

TABLE 66—A VALUATION OF ASSETS AND LIABILITIES AS OF

Liabilities	
Item	Present Value of Payments to be Made
Pensions to 1,521 Pensioners now on the pension roll of the fund, as follows: Service Pensioners:	
71 Men on annual pensions aggregating\$100,460 1,161 Women on annual pensions aggregating 899,640 Disability Pensioners:	\$ 614,610 8,879,450
11 Men on annual pensions aggregating 11,260 278 Women on annual pensions aggregating 174,530	107,850 1,979,300
Total Pensions Entered Upon	\$11,581,210
Pensions to such Members as will retire from the present force of 20,588 members: Service Pensions:	
Men	\$6,591,750 43,051,025
Men. Women	730,350 7,855,425
Total Pensions Not Entered Upon	\$58,228,550
Grand Total	\$69,809,760

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and liabilities of the Teachers' Retirement Fund as of June 30, 1914, and

OF THE TEACHERS' RETIREMENT FUND—VALUED JUNE 30, 1914

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand creditable to Men	\$174,590 708,125 1,000,125 3,183,600 6,944,335 57,798,985
Grand Total	\$69,809,760

Note—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however will probably be less than \$10,000,000.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners.

TABLE 67—THE AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Teachers' Retirement Fund

		DISABILITE F BRSIONS	SERVICE 1	SERVICE PENSIONS		AFTER		DISABILITY PENSIONS	PENSIONS	SERVICE	SERVICE PENSIONS	
*Date	Men	Women	Men	Women	Total	VALUA- TION	*Date	Men	Women	Men	Women	Total
914	\$10,078	\$171,432	\$95,122	\$882,164	\$1,159,696	31	1945	\$518	\$22,795	\$277	\$34,998	\$58,588
SIC	10,469	165,720	85,642	849,512	1,111,343	32	1946	420	19,972	31	27,839	48,425
9161	9,965	160,053	76,826	816.194	1,063,038	83	1947	334	17,359	132	21,842	39,667
1017	9,484	154,522	68,636	782,233	1,014,875	\$	1948	263	14,961	8,	16,884	32,195
81	900'6	148,816	61,044	747,693	966,539	35	1949	204	12,776	55	12,841	25,876
010	8,539	143,228	54,034	712,658	918,459	36	1950	154	10,803	33	109'6	20,591
00	8,078	137,710	47,599	677,215	870,602	37	1961	IIS	9,043	o i	7,051	16,228
1921	7,622	132,213	41,735	641,488	823,058	88	1952	88	7,488	2	5,075	12,656
1922	7,182	126,751	36,431	605,544	775,908	8	1953	57	6,130	~	3,573	9,765
123	6,741	121,331	31,663	569,573	729,308	\$	1954	38	4.954	~	2,458	7.452
77	6,310	115,952	27,402	533,716	683,380	7	1955	23	3,954	-	1,650	8,628
25	5,891	319,011	23,614	498,073	638,194	7	1956	13	3,113	:	1,078	4,204
92	5,489	105,332	20,263	462,870	593,954	\$	1957	7	2,415	:	683	3,105
27	5,098	100,101	17,306	428,242	550,747	\$	1958	•	1,845	:	417	2,265
 28	4,705	94,926	14,712	394,356	508,699	\$	1959	H	1,386	:	243	1,630
 6	4,335	89,817	12,450	361,369	1467.971	9	300	:	1,023	:	137	1,160
<u>ي</u>	3,980	84.776	10,489	329,430	428,675	47	1961	:	742	:	28	820
31	3,634	118'64	8,801	169'862	390,937	\$	1962	:	528	:	20	\$57
32	3,309	74,924	7,352	269,275	354,860	\$	1963	:	367	:	91	383
33	2,989	70,031	6,109	241,306	320,435	20	1964	:	250	:	•	259
34	2,690	65,433	5,045	214,882	288,050	5	1965	:	166	:	H	167
35	2,409	60,843	4,135	190,061	257,451	22	1966	:	901	:	:	901
36	2,149	56,370	3,367	166,955	228,84I	ន	1961	:	99	:	:	8
37	1,895	52,023	2,701	145,565	202,184	54	1968	:	39	:	:	39
38	1,665	47,803	2,145	125,904	177,517	25	1969	:	23	:	:	23
1939	1,450	43,728	I,678	910'801	154,872	8	1970	:	13	:	:	13
•	1,252	39,805	1,295	91,845	134,197	57	161	:	7	:	:	~
1941	1,073	36,044	984	77,363	115,464	28	1972	:	*	:	:	*
1942	116	32,453	735	64,527	98,626	20	1973	:	-	:	:	-
1943	763	29,046	241	53,206	83,556		,	Т				
1961	634	25,819	391	43,426	70,270		Totals	\$152,928	\$3,010,758	\$771,062	\$12,529,858	\$16,473,606

Date Year Beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund, expressed as a percentage of the employee's salary:

TABLE 68—THE RATES OF CONTRIBUTION, EXPRESSED AS PERCENTAGES OF SALARIES, NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE TEACHERS' RETIREMENT FUND

AGE AT		Men			Women	
ENTRANCE	Total	Disability Pension	Service Pension	Total	Disability Pension	Service Pension
20	3.45	.40	3.05	6.49	1.41	5.08
21	3 · 54	.41	3.13	6.71	1.40	5.31
22	3.64	.42	3.22	6.90	1.36	5 · 54
23	3.73	.42	3.31	7.06	1.30	5.76
24	3.83	.43	3.40	7.17	1.22	5.95
25	3.93	.43	3.50	7.25	1.13	6.12
26	4.04	-44	3.60	7.30	1.03	6.27
27	4.13	-44	3.69	7.32	.93	6.39
28	4.24	-45	3.79	7.30	.83	6.47
29	4.33	.45	3.88	7.25	.73	6.52
30	4.41	.45	3.96	7.18	.64	6.54
31	4.49	.45	4.04	7.09	1 .57	6.52
32	4.56	.46	4.10	6.98	.51	6.47
33	4.61	.45	4.16	6.85	.45	6.40
34	4.64	.45	4.19	6.69	.40	6.29
35	4.63	·43	4.20	6.51	-35	6.16
36	4.61	.42	4.19	6.30	.30	6.00
37	4.56	.40	4.16	5.89	. 26	5.63
38	4.47	.37	4.10	5.84	.23	5.61
39	4.34	.34	4.00	5 · 59	.19	5.40
40	4.20	.31	3.89	5.32	.16	5.16

HEALTH DEPARTMENT PENSION FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW! AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Health Department Pension Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

TO EMPLOYEES

- (1) Upon application after 20 years' service, a pension not to exceed one-half final salary of employee of same grade.
 - The average allowance has been about 49 per cent. of final salary.
- (2) Upon disability incurred in the actual performance of duty, pensions of one-fourth to one-half final salary.
 - The average allowance has been about 47 per cent. of final salary.
- (3) Upon disability resulting from causes not connected with the actual performance of duty, and incurred after 20 years of service, a pension not to exceed one-half final salary of employee of same grade.
 - No pension in the past has been granted under this benefit. This valuation is based upon an allowance of 50 per cent. of final salary.
 - Pensions to employees disabled in actual performance of duty are revocable. Pensions to employees after 20 years' service are not revocable.

To widows of employees

- (4) Upon death of an employee from injuries sustained or disease contracted in actual performance of duty, a pension of \$300 per annum.
 - Pensions to widows are terminated automatically by death or remarriage and are subject to revocation.

To CHILDREN OF EMPLOYEES

- (5) Upon death of an employee from injuries sustained or disease contracted in actual performance of duty, if there be no widow's pension; otherwise upon termination of widow's pension, a pension of \$300 per annum.
 - Pensions to children are terminated by death, marriage, attainment of age 18, or revocation.

TO DEPENDENT PARENTS OF EMPLOYEES

- (6) Upon death of an employee from injuries sustained or disease contracted in actual performance of duty, a pension of \$300 per annum to widowed mother.
 - Pensions to widowed mothers cease on remarriage and are subject to revocation.

Contributions

BY EMPLOYEES

One per cent. of salaries.

By CITY

Indirect contributions:

Miscellaneous revenues, such as moneys collected from fines and penalties for violation of the sanitary code.

Direct contributions:

None provided.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rates of death (1) from causes arising in the actual performance of duty, and (2) from other causes

Rates of disability (1) from causes arising in actual performance of duty, and (2) from other causes

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

Certain other rates applying to the family of employee which are developed fully in section III, page 305, of this report.

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The Health Department Pension Fund includes all physicians and other employees who have filed with the comptroller consent that deductions from their salaries be made for the support of the fund. The schedules representing all physicians and other employees were therefore divided according to the payroll of June 30, 1914, into those for contributors and those for non-contributors. The former class only is considered in this section of the report. The schedules for the latter class were further subdivided and included under the various divisions of the City of New York Employees' Retirement Fund.

The fact that Health Department employees who contribute to the Health Department Pension Fund are pensioned from that fund, whereas those who do not contribute are pensioned from the City of New York Employees' Retirement Fund was not always clearly understood by the Health Department employees themselves, and some of them in filling out the schedules for the Commission on Pensions reported themselves as pensionable from the Health Department fund, whereas actually they were pensionable from the City of New York Employees' Retirement Fund. That such a misunderstanding had existed was not discovered until the experience tables had been tabulated and the rates were being prepared. Resort was had to the payrolls of the Health Department as of June, 1914,

and the names secured of all employees who actually contributed to the Health Department fund. By use of this list the schedules of the Commission were corrected. The question then arose as to the necessity and advisability of retabulating the experience tables and reworking the rates. Investigation was therefore made to determine to what extent-the changes would affect the rates derived from the original tabulation. It was found that in the table for men, which is the principal one employed, the number in active service would be reduced by 140 and that 102 of the 140 had had less than five years' service, and that all were distributed over the ages in about the same proportions as the remaining active members. The effect of their inclusion was to increase the exposed to risk column and-since the out of service cards are correct, having been secured from the records in the first instance to give lower rates of separation, especially in the select years. If the rates of resignation and dismissal had been recomputed on the reduced exposure resulting from the exclusion of the schedules for these employees, they would have been very high and, before they were used, would have been reduced to make them somewhat more conservative. The exaggerated exposure accidentally used had resulted in a reduction of less than 15% in all the rates derived by its use. Since the rates of disability and of service retirement for the service were adopted rates, as is explained later in this section of the report, they were in no way affected by this difference in the exposure. Because of these conditions the use of the first tabulation was considered satisfactory. The rates were of course applied to the corrected figures in the remaining processes of the valuation.

Special methods of handling data

The schedules for men and women members were separated and tabulations were made in the general form showing for each sex the number of separations from service occurring in the six-year period of experience. These tabulations indicated such a high total rate of separation from active service that it was apparent that the rates could not be satisfactorily employed in the construction of an aggregate service table. Tabulations of the experience were then made in a select form in which the number of separations from service during the first three years of service were tabulated separately by years and only separations from service occurring after the third year were combined. The gross rate of separation was accordingly reduced approximately for men from 20% in the first year of service to 6% after three completed years of service; for women from 22% in the first year of service to 6% after three completed years of service.

The table on page 125 shows, for the active service, the extent of the exposure used and the number of separations, classified by cause, occurring in the first three years of service and after three completed years of service.

Of the total number of separations occurring in the first year of service resignations formed 98.4% among the men and 95.3% among the women. Of the total separations occurring after three completed years of service resignations formed only 56.0% among the men and 86.7% among the women. The separations from each of the other causes, however, do not show a marked variation with years of service. It was assumed, therefore, that the rate of resignation only was primarily affected by years of service

TABLE 69—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Health Department Pension Fund

			WITHDRAWALS			DEATHS		SEPARA	SEPARATIONS BY DISABILITY	ABILITY		
YEARS OF SERVICE	Exposed to Risk	Resignations	Dismissais	Total	In Performance of Duty	Other Causes	Total	In Performance of Duty	Other	Total	Service Retirements	Total Separations
Men One	613.5	123	н	124	:	н		:	:	:	:	125
Three	532.0 532.0 4,437.0	¥ 6 	1 4 7	3 4 %	:::	1 + ‡	=	: : '	:::	: : ' ^	: :\$	8 4 8
Total	6,120.0	366	23	389	:	4	2	S	:	S	54	492
Women One Two Three. Ultimate	580.5 459.0 381.5 1,741.0	122 56 44 85	n n u o	128 57 46 87	::::	:::•	:::•	::::	::::	::::	:::«	128 57 46 98
Total	3,162.0	307	11	318	:	6	6	:	:	:		329

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and that select rates of resignation should be graduated directly from the data, while other select rates of separation could be obtained from ultimate rates by the use of the method previously described on page 29.

The tabulations showed marked differences between the men and the women in respect to the rates of separation from the service in the first three years after entrance. Tables on a select basis for the first three years of service were therefore prepared treating men and women separately. A comparison between roughly graduated rates based on the ultimate experience of men and women combined and similar rates based on the ultimate experience of men alone indicated that combining the experience of women with that of men tended to increase the rate of dismissal. The total ultimate rates of withdrawal from men and women combined were not materially different from those for men alone, and as the number of women included in the active service is small and cannot be assumed to bear always the same ratio to the total number of employees as it bears in the experience used, it seemed advisable to use the experience for men as a basis for ultimate rates for the entire service.

Although tabulations of salaries were made for men and women as a basis for salary scales, according to the general method outlined in section I, page 31, they were used in a method somewhat different from the method employed in the other funds. The following table gives a summary of the experience which was available:

TABLE 70—SUMMARY OF EXPOSURE—SALARY
Health Department Pension Fund

Clase	Number of Annual Salaries	Total Payroll
Active Members: Men	4,361 2,328	\$4,686,930 1,827,860
Men	147 3	249,220 27,000
Total	6,839	\$6,791,010

The salary curve or salary scale for men, which was roughly graduated from the salaries of active members alone, is very much lower in the later ages than the corresponding curve for pensioned members. A comparison between the salary scale based on the salaries of active and pensioned members combined, with a scale based on salaries received by pensioners alone prior to retirement shows, furthermore, that the salaries drawn by pensioners previous to retirement are in excess of those drawn by active members at the corresponding ages. These facts would seem to indicate that the members who retire belong generally to the high salaried class. That allowance for this condition might be made, all future contributions were valued by the salary scale formed from the salaries of active service and pensioned members combined, while the present values of all benefits were based upon the salary scale derived from the salaries of pensioned members. This procedure, therefore, called for the final graduation of the two salary scales, which accounts for the publication of two scales instead of the customary single scale in connection with the active service table.

Because of the paucity of data no scale of salaries for women employees could be prepared which would correspond to the one for men based on the salaries of pensioners prior to retirement. The salary scale for the women members of the active force is, therefore, the only one which can be considered, even though the apparent selection of high salaried members for retirement may be assumed to affect the women as well as the men. The tabulations covering active members showed that the salaries of women were generally lower than those for men, but the salary scale for women has much the same form as that for men. Since the salary scale is employed simply to show ratios of increase in salaries and not the probable actual salaries, it was thought advisable to use the salary scales based on the salaries of men rather than to prepare a new scale for women.

The experience regarding pensioners was used in accordance with the general methods employed in all funds, consequently it is presented in the following summary without comment:

TABLE 71—SUMMARY OF EXPOSURE AND SEPARATIONS— EMPLOYEE PENSIONERS

Class	Exposed to Risk	Deaths
Disability Pensioners	44 240	2 4
Total	284	6

Health Department Pension Fund

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report, but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation thereof.

Rates developed on a select basis are compared first with rates developed on the same basis and then with aggregate rates. In order to make comparison with aggregate rates the select and ultimate rates have been respectively multiplied into a standard service exposure, which has been subdivided by years of service, and the expected cases of separation obtained in this way have been contrasted with the cases obtained by use of the comparative aggregate rate and the same exposure. This method is explained in detail on pages 392 and 393.

The active service

The following tables show the rates used in constructing the active service table. Separate rates were used for men and women with less than three years' service. The ultimate rates are the same for both men and women and apply to all employees with three completed years of service. To visualize the increases and decreases in these rates from age to age and to show their relative importance at various ages, diagrams showing the rates plotted on cross section paper are given on pages 134 to 139.

TABLE 72—RATES OF SEPARATION FROM ACTIVE SERVICE

Health Department Pension Fund-Men

				RATES (RATES OF WITEDRAWAL	YMYT				[RATES OF DEATE	7 Деатн	
AGE		Resign	Resignation			Dismissal	lesal		Total Ultimate		In Performs	in Performance of Duty	
	r w q (x)	' ** q(a)	r w q (a)	r . g q (a)	d w Q (a)	4 w Q (x-1)+1	2+iz-4]bap	(a) Dag	*ba	(g) \bar{b}_{g}	**************************************	**************************************	*eq(a)
15	.0232	:	:	:	.0179	:	:	:	:	:	:	:	:
16	.0272	.0260	:	:	.o.74	6210.	:	:	:	:	:	:	:
17	.0328	.0310	.0250	:	9910.	.0172	7410.	:	:	:	:	:	:
18	.0395	.0370	.0320	9900.	.or 56	.0162	8910.	.0172	.0238	:	:	:	:
19	.0488	.0450	.0400	0010	.0143	.0148	.o154	.0159	.0259	:	:	:	:
20	.0650	.0520	.0490	0/10.	.0127	.or34	.0138	.0143	.0313	:	:	:	:
21	.0915	.0590	.0580	.0284	.0112	1210.	.0125	6210.	.0413	1000	:	:	:
77	.1210	0890.	9990.	.0320	2600.	8010.	.0112	7110.	.0437	1000	1000	:	:
23	.1500	.09	.0730	.0344	. 0085	2600.	.0102	9010.	.0450	1000	1000 1	1000	1000
4	0181.	.0840	0620.	.0362	.0073	.0087	.0002	9600	.0458	1000	1000	1000	000
22	. 2080	.0915	.0840	.0377	+900.	6200.	→ 800.	8800.	.0465	1000.	1000	1000	1000.
36	. 2300	. 1005	.0877	.0390	.0057	.0072	.0077	1800.	.0471	1000.	.000	.000	.000
27	. 2430	. 1080	0160.	.0401	1500.	3900.	1/00.	.0075	.0476	.000	.000	.000	.000
38	. 2530	.1145	.0940	.0411	.0047	900.	.0065	6900	.0480	.000	.000	.0003	.003
50	. 2600	.1200	900.	.0420	.0042	.0055	900.	. 0004	.0484	.000	.0003	.0003	.00
30	. 2660	. 1250	0860.	.0420	.0039	.0051	.0056	.0059	.0485	800.	900 90	•	.004
31	. 2695	0621.	001.	.0432	.0030	.0047	.0052	.0055	.0487	000.	200.	900	9000.
32	. 2730	.1325	. 1012	.0437	.0033	.0043	. 0048	.0051	.0488	000	0000	8000	6 00.
33	. 2740	.1355	. 1020	.0442	.003I	900.	.0045	.0047	0489	.0007	6 000.	0I00·	1100.
46	.2750	.1375	. 1023	.0444	.0038	.0038	.0042	4400.	.0488	8 8 8	00100	.0012	.0012
35	.2745	.1390	. 1023	0440	. 8027	.0035	.0039	1700	.0487	8	1100	.812	.0013
90	.2735	1400	1021	.0447	. 8025	.0033	. 9937	. 0039	0480	8	2100	.0013	• 100 .
37	.2715	.1405	. 1013	.0447	.0024	.0031	.0034	.0030	.0483	8	.0012	¥100.	. 0014
20 (. 2070	. 1402	86.	.0445	.0022	9020	.0032	.0034	0479	0100	.0013	*100·	. 0015
5	. 2030	. 1399	.0985	0443	.0022	.0020	.0030	.0032	.0475	0100	.0013	100·	. 001S
2 :	. 2570	. 1385	7 060.	.0438	1500	.0020	.0020	930	.0408	0100.	.0013	. 0014	.0015
4	:	. 1305	0460	.043I	:	.0025	.0027	.0028	.0459	:	. 00I3	4 100.	. 001S
42	:	:	.9905	.0423	:	:	.0025	.0020	.0440	:	:	• 00I4	. 0015
4	:	:	:	.0412	:	:	:	.0025	.0437	:	:	:	.0015
‡	:	:	:	.0397	:	:	:	.0023	.0420	:	:	:	. 00IS
45	:	:	:	.0377	:	:	:	.0022	.0399	:	:	:	.0014
\$:	:	:	.0345	:	:	:	.0021	.0300	:	:	:	•
47	:	:	:	.0297	:	:	:	.0030	.0317	:	:	:	.00I3
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TABLE 72—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued Health Department Pension Fund—Men

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AGE		Resign	Resignation			Dismissal	issal		Total Ultimate		In Performance of Duty	nce of Duty	:
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23	:	:	:	.0120	:	:	:		.or35	:	:	:	.000
ß	:	:	:	.0102	:	:	:	.0014	9110.	:	:	:	.000
2	:	:	:	. 0083	:	:	:	.0013	9600.	:	:	:	.000
55	:	:	:	.0067	:	:	:	.0012	6200.	:	:	:	.003
2	:	:	:	.0053	:	:	:	.0012	.0065	:	:	:	.0003
27	:	:	:	.0040	:	:	•	1100.	1500.	:	:	:	.0003
88	:	:	:	.0027	:	:	:	0100	.0037	:	:	:	.000
8	:	:	:	.0013	:	:	:	0100	.0023	:	:	:	.000
8	:	:	:	1000	:	:	:	600 000	0100.	:	:	:	.000
5	:	:	:	:	:	:	:	600 000	600 0	:	:	:	.0002
3	:	:	:	:	:	:	:	800.	8000	:	:	:	.000
8	:	:	:	:	:	:	:	8000	800	:	:	:	1000
Z	:	:	:	:	:	:	:	.000	7000.	:	:	:	1000
65	:	:	:	:	:	:	:	900 000 000 000 000 000 000 000 000 000	9000	:	:	:	.000
8	:	:	:	:	:	:	:	.0004	4000	:	:	:	1000
29	:	:	:	:	:	:	:	.0003	.000	:	:	:	1000
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TABLE 72-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued Health Department Pension Fund-Men

Ags 4 (a) 4 (b) 15 (c) 15 (c) 16 (c) 17 (c) 18 (c) 19 (c)	Not in Performance of $\begin{pmatrix} {}^{o}q_{\{[s-1]+1\}} \\ & & & \\ & & & \\ & & & \\ \end{pmatrix}$										SERVICE
	o4Q(s)+11	mance of Duty		Total Ultimate		In Performs	In Performance of Duty		Not in Performance of Duty	Total Ultimate	RETIRE
	:	°4Q(a)	•4q ^(a)	dq(a)	$a_i r_{q(x)}^{(a)}$	e4 Q(a)	e4, q(s)	61, Qz	ofrq(a)	, rq(a)	•rq(a)
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	.0020	.0020	.821	.0021	.000	.000	.000	.000	:	2000	:
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	.0021	.0022	.0023	.0023	.000	.0003	.0003	.0003	:	.0003	:
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	.0048	.0053	00.	1,00.	800°	0100	118	2100.	:	.0012	150
1700.	.0052	.0057	000	.0075	80	1100	.0012	.0012	:	.0012	0000
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	:	2900.	.007	. 0085	:	:	.0012	.0013	:	.0013	6 600.
.:	:	:	.0075	80.	:	:	:	.0013	:	.0013	.0120
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20			.0130	.0139		-		.0016	1000.	1 2100.	.0284

TABLE 72—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued

Health Department Pension Fund-Men

	A	RATES OF DEATH					RATES OF DISABILITY	ITY			1
	Not in Performance of	mance of Duty		Total Ultimate		In Performa	In Performance of Duty		Not in Performance of Duty	Total Utimate	SERVICE RETIRE- MENT
(a) D .	°4 q(a)	°4 q(a)	· 4 q (a)	* Q (a)	atrq(a)	$ai_rq^{(a)}_{[x-1]+1}$	atr (a)	atrq(a)	of r Q 2	, rq (a)	•rq (8)
 -	:	:	.0141	.0147	:	:	:	91∞.	.0003	6100.	.0311
:	:	:	.0150	.0155	:	:	:	9100.	.0005	.0021	.0338
:	:	:	910.	* 910.	:	:	:	9100.	8000.	.0024	.0365
:	:	:	6910.	.0173	:	:	:	.0015	.0013	.0038	.039I
:	:	:	6 <u>7</u> 10.	.0182	:	:	:	.0015	6100.	.0034	.0419
:	:	:	. o189	.0192	:	:	:	. 0014	.0027	.0041	.0450
:	:	:	, 010.	.0201	:	:	:	.0012	.0030	.0048	.0480
:	:	:	.0200	.0208	:	:	:	600 0.	.0045	.00 54	osio.
:	:	:	.0211	.0213	:	:	:		.0050	1000.	.0541
:	:	:	.0210	.0218	:	:	:	.003	.0005	.000	.0575
:	:	:	.0220	.0222	:	:	:	.000	.0072	4 /00.	.0012
:	:	:	.0223	.0225	:	:	:	000	.0070	.0077	.0650
:	:	:	.0227	.0228	:	:	:	1000	. 00,79	800.	900
:	:	:	.0231	.0232	:	:	:	:	.0082	.0082	.0735
:	:	:	.0233	.0234	:	:	:	:	.083	.0083	.0782
:	:	:	.0237	.0238	:	•	:	:	.003	.0083	.0840
:	:	:	.0240	.0241	:	:	:	:	.0082	.0082	8
:	:	:	.0244	.0245	:	:	:	:	.0077	.0077	.0071
:	:	:	.0249	.0250	:	:	:	:	6 0 0 0	6000	. 1057
:	:	:	.0255	.0250	:	:	:	:	8	0000	1157
:	:	:	.0202	.0203	:	:	:	:	.0050	.0050	. 1285
:	:	:	.0271	.0272	:	:	:	:	.043	50 50 50	54,
:	:	:	.0284	.0284	:	:	:	:	.0030	.0030	. 1040
:	:	:	.0208	.0298	:	:	:	:	.831	.0031	. 1900
:	:	:	.0316	9160.	:	:	:	:	.0020	.0020	. 2260
:	:	:	.0339	.0339	:	:	:	:	.0021	.0021	. 2720
:	:	:	.0366	.0366	:	:	:	:	.0017	.0017	.3230
:	:	:	.0400	.0400	:	:	:	:	\$ 100.	\$100 .	.3730
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:	:	:	.0507	.0507	:	:	:	:	.0007	.000	.4740
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TABLE 73—RATES OF SEPARATION FROM ACTIVE SERVICE
Health Department Pension Fund—Women

				RATES (RATES OF WITHDRAWAL	IWAL					RATES OF DEATH	, Вкати	
AGE		RESIGNATION	ATION			DISMISSAL	SAL		Total Ultimate		IN PERFORMANCE OF DUTY	ICE OF DUTY	
	$r_{w}q_{(x)}^{(a)}$	$\left \begin{array}{c} r_w q_{(x-1)+1}^{(a)} \end{array}\right $	r w q (s)	$r_{\boldsymbol{v}}q_{[x]}^{(a)}$	6 v q (a)	$d \omega q_{(x-1)+1}^{(a)}$	€ w q (2, 2) + 2	d w q (a)	*q(a)	•4q(a)	•4q(a)	•4q(s-2)+3	*4q**
15	.0343	:	:	:	6710.	:	:	:	:	:	:	:	:
16	.0352	.0293	:	:	.0175	1810.	:	:	:	:	:	:	:
17	.0400	.0320	6600	:	8910.	.0175	.0180	:	:	:	:	:	:
8	.0470	.0345	.0150	9900.	.0158	.0165	1/10.	.0172	.0238	:	:	:	:
61	.0560	.0395	.0225	010.	.0140	.0152	.0157	.0159	.0259	:	:	:	:
25	0600	.0450	.0300	.0170	.0130	.0130	1410.	.0143	.0313	: 8	:	:	:
7 6	0080	.0507	.0390	4020	2110	4.10	3110	0.1.0	. 0413	3 8	: 8	:	:
4 6	. 1003	986	2020	0346	2000	8000	2010	9010	04.50	1000	1000	. 60	: 6
3 %	.1322	2000	.0740	.0362	9200	9800.	.0002	9000	.0458	1000	8		000
25	1400	9901.	0880	.0377	9900	.0077	.0084	. 0088	.0465	1000	1000	1000	1000
3 6	. 1680	. 1260	.1000	.0300	.0058	8900.	9200.	1800.	.0471	.000	.000	.000	.000
27	.1873	. 1380	0011.	.0401	1500.	.0062	6900	.0075	.0476	.000	.000	.000	.000
78	. 2060	. 1460	.1185	.0411	.0046	.0056	.0063	6900	.0480	.000	.000	.0003	.000
52	. 2240	.1520	.1250	.0420	.0041	.0051	.0058	7 000.	.0484	.000	.003	.0003	.000
30	.2360	.1560	. 1305	.0426	.0037	.0047	.0054	.0059	.0485	.0003	7000	,000 400	4000
31	. 2460	. 1595	.1350	.0432	.0034	.0043	.0050	. 0055	.0487	.000S	000.	200 200	9000
32	. 2530	. 1615	.1390	.0437	.0031	.0040	0040	.0051	.0488	.0005	.000	8000	6 00.
£ 5	. 2580	. 1627	. 1420	.0442	.0020	0037	.0043	.0047	.0439	.000	600	0100	1100
ν. 4 υ	.2010	.1028	.1435	.0444	.0027	.0035	900.	4400	.0400	8 8	0100	1100	8 8
, e	. 2030	0201.	2441	2440	3 6	3	38	1 6	79,0	8 8	3 :	38.	8.3
37	0202	1500	144/	. 0447		. 658	8.8	900	.0483	8	8 8	218	4100
38	. 2550	1555	.1420	.0445	.0022	.0027	.0031	.0034	.0479	0000	.0012	.0013	.0015
30	. 2470	.1517	. 1390	.0443	1200.	9200.	.0020	.0032	.0475	0100	.0012	4100.	.0015
\$. 2380	. 1465	. 1340	.0438	.0020	. 0025	.0027	. 0030	.0468	0100.	.0012	4100.	. 0015
7	:	. 1400	.1280	.0431	:	. 0024	.0026	.0028	.0459	:	.0013	4100.	.0015
42	:	:	911.	.0423	:	:	. 0025	.0026	. 0449	:	:	4 100.	.0015
₹.	:	:	:	.0412	:	:	:	. 0025	.0437	:		:	.0015
‡:	:	:	:	.0397	:	:	:	. 0023	.0420	:	:	:	.00.
4	:	:	:	.0377	:	:	:	. 0033	6660.	:	:	:	.0014
\$;	:	:	:	.0345	:	:	:	.0021	.0300	:	:	:	.0014
>	:	:	:	.0207	:	:	:	.0030	.0317	:	:	:	.0013
5 4	:	:	:	.0233	:	:	:	8100	.0251	:	:	:	.0012
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8	-			B010.	-	-		8	.0180	7			0000

TABLE 73-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued

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Health Department Pension Fund-Women

Total Tota				RATES C	RATES OF WITHDRAWAL	AWAL					RATES O	RATES OF DEATH	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		RESIGN	MATION			Disad	SSAL		Total Ultimate		In Perporma	NCE OF DUTY	
	r w q (a)	r w q (a)	r w q (a)	' w q (a)	(z) bap	d $_{w}q_{[x-1]+1}^{(a)}$	d w q (a)	(z) bap [z]	* b a	adq(a),	$^{a_d}q_{[x-1]+1}^{(a)}$	ad q(a)	* Pa (a)
0010 0010 0001 0001 0001 0001 0001 0001 0001 0001 0001 0000	:	:	:	.0141	:	:		2100.	9210.	:	:	:	8.
00102 00007 00	:	:	:	.0130	:	:	:	.0015	, or 35	:	:	:	8
0000 0012 0079 0013 00999 0012 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 00999 0013 0013	:	:	:	.0102	:	:	:	4100.	9110.	:	:	:	8
0.0007 0.0053 0.0040 0.0011 0.0011 0.0013 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00	:	:	:	.0083	:	:	:	.0013	9600.	:	:	:	8
0011 0001 0027 0010 0037 0001 0003 0000 0000 0000 000 0000 0000 0000 0000 0000 00	:	:	:	.0067	:	:	:	.0012	.0079	:	:	:	<u>8</u>
0001 0001 0001 0001 0001 0001 0001 000	:	:	:	. 0053	:	:	:	.0012	.0005	:	:	:	<u>8</u>
0000 0000	:	:	:	.0040	:	:	:	1100.	.0051	:	:	:	<u>8</u>
0001 0000	:	:	:	.0027	:	:	:	0I00	.0037	:	:	:	8
00000 000000	:	:	:	.0013	:	:	:	0 0 1 0	.0023	:	:	:	<u>8</u>
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0000 0000 0000 0000 0000 0000 0000 0000 0000	:	:	:	:	:	:	:	8000.	8000	:	:	:	<u>8</u>
0000 000 000 000 000 000 000 000 000 0	:	:	:	:	:	:	:	8000	8000	:	:	:	<u>8</u>
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7000. 7000.	:	:	:	:	:	:	:	900.	9000	:	:	:	<u>8</u>
	:	:	:	:	:	:	:	.0004	.000	:	:	:	<u>.</u>
	:	:	:	:	:	:	:	80 20 20	.000	:	:	:	<u>.</u>
	:	:	:	:	:	:	:	1000.	1000	:	:	:	<u>8</u>
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	:	:	:	:	:	:	:	:	:	:	:	:	:

TABLE 73—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued

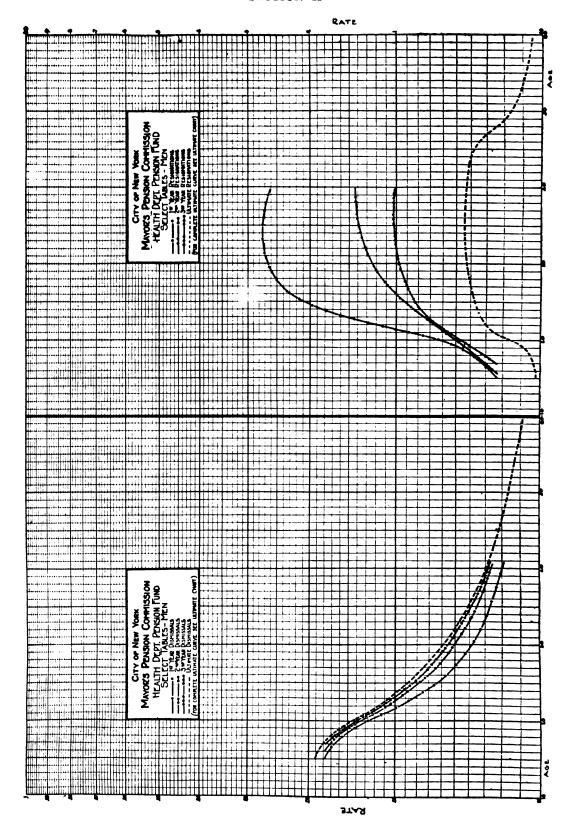
Health Department Pension Fund-Women

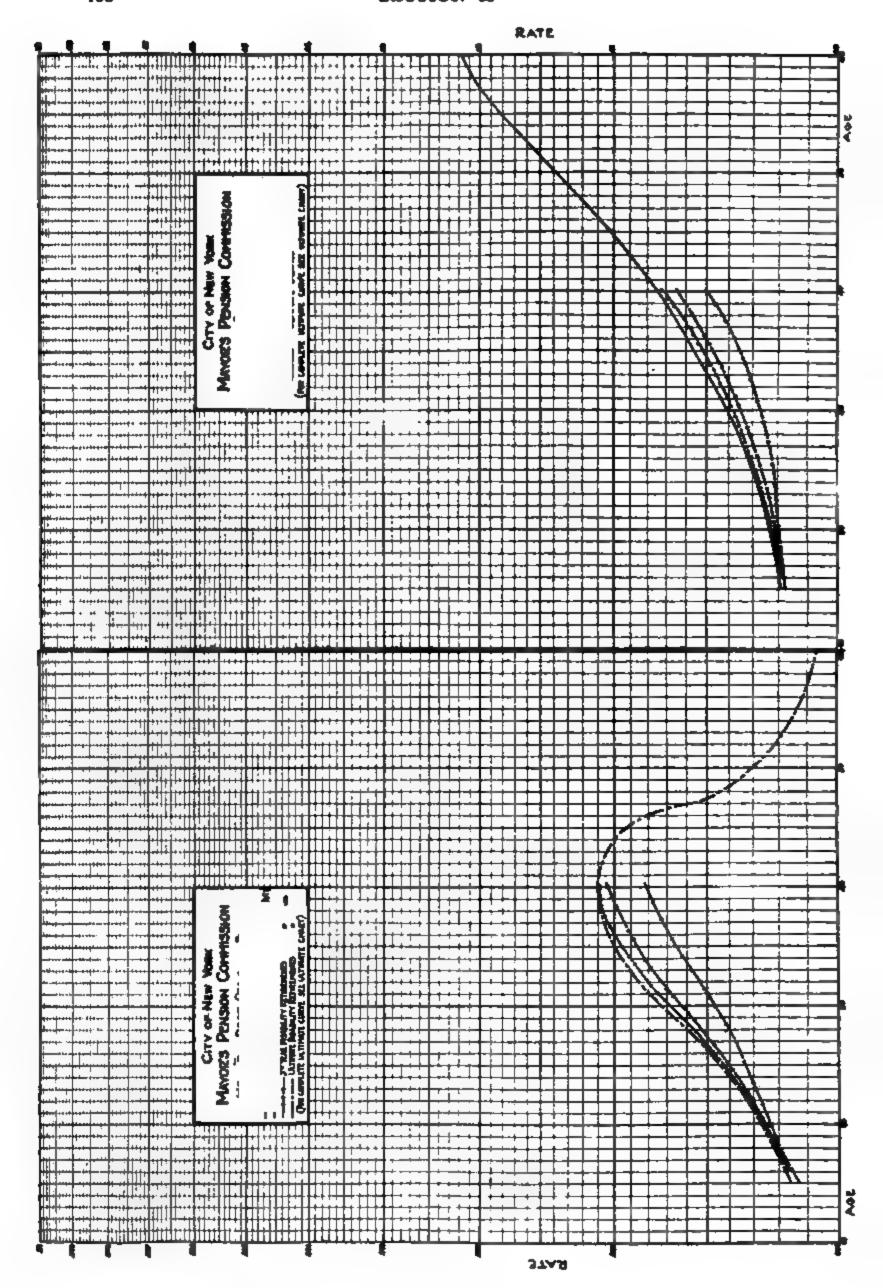
		RA	RATES OF DEATH					RATES OF DISABILITY	111			
AGE		NOT IN PERFORMANCE OF DUTY	LANCE OF DUTY		Total Ultimate		IN PREFORMANCE OF DUTY	CE OF DUTY		Not in Performance	Total	Rate of Service Retirement
	·4 q(a)	·4q(a)	**************************************	·4Q(a)	4Q"	**************************************	** q(a) +1	a'rq(a)	afrq(a)	of, Q.		•rq.
15	818		:	:	:	1000	:		:	:	:	:
16	8100.	0100	:	:	:	.000	.000	:	:	:	:	:
17	0100	0100	.0020	:	:	.000	.000	.0003	:	:	:	:
18	0100	.0020	.0021	.0021	.0021	.000	.000	.000	.000	:	.000	:
19	.0020	.0021	1200.	.0022	. 0022	.000	.000	.000	.000	:	.000	:
20	1200.	.0022	.0022	. 0023	.0023	.000	.0003	.0003	.0003	:	.0003	:
21	.0021	.0023	.0024	.0024	.0024	.0003	.003	.0003	.0003	:	.0003	:
22	.0022	. 0024	.0025	.0026	9200.	.0003	.0003	.0003	.0003	:	.0003	:
3 3	.0022	.0024	.0025	.0026	.0027	.0003	.0003	7 000.	7 000.	:	.000	:
7	.0022	.0025	9200.	.0028	.0029	.0003	7 000.	.0004	.000	:	7000	:
25	.0022	.0025	.0027	.0020	.0030	.0003	7 000.	\$ 000.	8005	:	.000	:
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32	9000.	.0034	.0038	.0043	.0050	9000	800	6000	0100	:	0100	:
ဓ	. 0038	.0036	1400.	. 0045	.0050	.0007	8000	0100	1100.	:	1100	.000
37	.0030	.0039	.0044	.0040	.0003	.000	6 000.	0100	1100.	:	1100	.001
20	.0033	. 0042	.0047	.0052	.000	.000	6000	0100	.00.	:	.0012	.0030
96	.0030	. 0045	.0050	00.	1/00.	8	0I0	1100	.0012	:	.0012	.0041
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4	:	.0057	90°.	.0005	80°.	:	0100	1100	. 0012	:	2100.	.0077
42	:	:	8000.	.870	.0085	:	:	.0012	.0013	:	.0013	6600
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\$:	:	:	:	1800	0000	:	:	:	.0013	:	.0013	.0140
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74	:	:	:	.0103	9110.	:	:	:	.0015	:	. 001S	1120.
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TABLE 73-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued

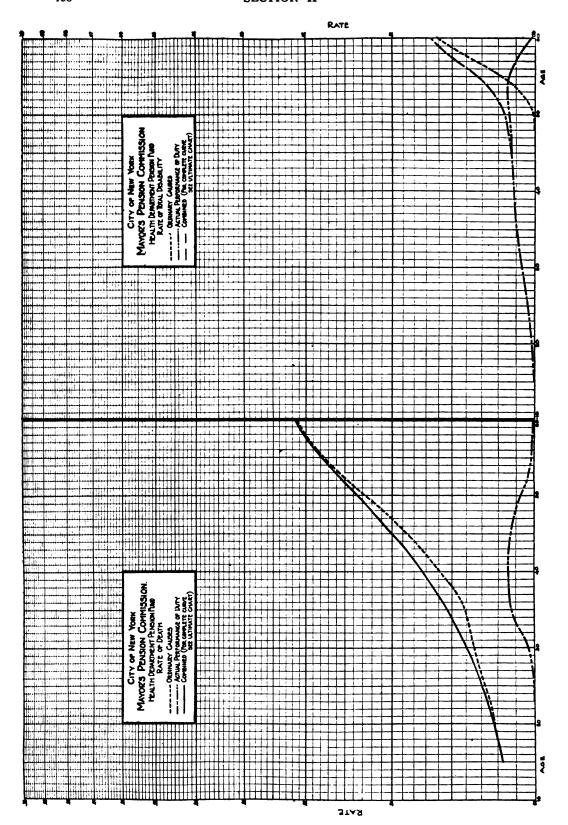
Health Department Pension Fund-Women

	Rate of Service Retirement	*rq**	.0311	.0338	.0365	1080.	.0419	.0450	.0480	.0510	.0541	.0575	.0612	.0650	0690 ·	.0735	.0782	.0840	86	1260.	. 1057	. IIŠ7	.1285	1440	1040	. 1900	2200	. 2720	.3230	.3730	.4310	.4740	. 5330	.5910	.0400	.7000	./430
	Total Ultimate	1	6100.	1000.	. 0024	.0028	.0034	.0041	.0048	. 00.54	1000.	8900.	.0074	.0077	800.	.0082	.0083	.0083	.0082	.0077	000	8 8 8	.0050	.0043	.0030	. 0031	.0030	1200.	.0017	418	0100	.000	.003	:	:	:	
	Not in Performance of Duty	of. Q.(a)	.0003	2000	8000	.0013	6100.	.0027	.0036	.0045	9500.	.0065	.0072	9200.	6200.	.0082	.0083	.0083	.0082	.0077	600	900.	. 0050	. 8043	. 9030	. 0031	. 0030	1200	.0017	4100	0100	.000	.003	:	:	:	-
ITY		$a\epsilon_r q^{(a)}_s$	9100.	9100.	9100.	.0015	\$100.	4100	.0012	6 00.	800.	.003	.000	1000	1000	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	- :	:
RATES OF DISABILITY	IN PERFORMANCE OF DUTY	** q(*)	:	•	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	•	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	In Perporma	$^{ai}_{r}q_{[x-1]+1}^{(a)}$:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
		a(rq(a)	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Total Ultimate	$q_{z}^{(a)}$.0147	.0155	.0164	.0173	.0182	2610.	.020	.0208	.0213	.0218	.0223	.0225	.0228	.0232	.0234	.0238	.0241	.0245	.0250	.0250	.0263	.0272	.0284	.0208	.0310	.0339	.0300	0400	.0448	.0507	0 00 0.	.0750	. II45	0.791	2007
		·4 q (a)	.0141	.0150	.0160	6910.	6/10.	.o189	8610.	9020.	.0211	.0216	.0220	.0223	.0227	.0231	.0233	.0237	.0240	.0244	.0249	.0255	.0262	.0271	.0284	.0208	.0310	6280.	.0300	0 1 0.	.0448	.0507	000 000	.0750	.1145	0791	2036
RATES OF DEATH	MANCE OF DUTY	2+[2-2] b p o	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
RA	Not in Performance	•4q(a) [2-1]+1	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
		· • • Q(a)	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
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RATE



RATES OF RESIGNATION AND DISMISSAL

The rates of resignation for the employees in the Health Department in the first three years after entrance, as has been stated, vary materially with the exact length of service and the sex of the employees considered. The rate of resignation in the first year for men is the highest of any such rate developed on a select basis; being higher than that for clerks, although in the ultimate years the clerks' rate is higher.

Considered as an aggregate rate, the rate of resignation for employees in the Health Department is the highest of the seven rates of resignation prepared for city departments. The rate of resignation used for women is the same as that used for men, except in the select years for which the rate is slightly lower in the first year and higher in the second and third years.

The aggregate rate of dismissal for men ranks next to the lowest of all the dismissal rates derived, lying between that for the Police Department, which is higher, and that for the Fire Department, which is the lowest of the seven rates prepared.

The rates of resignation and dismissal combined form a total rate of withdrawal for the Health Department, which is the highest of all such rates considered, the next highest being that for clerks in the City of New York Employees' Retirement Fund. The total rate of withdrawal from service by resignation or dismissal in the Health Department changes little from age twenty-eight to about age thirty-eight.

Rates of withdrawal in other branches of the city service are higher in the age groups from twenty to thirty, but in general decrease more rapidly after their maximum points are reached. It may be that the number of professional men in the Health Department, which is about half of the total force, is large enough to influence the rate of withdrawal of all employees and that the inclination of this class of employees to resign in order to practice privately causes the rates of separation to be higher than among the general employees who have become established in their occupations.

RATE OF DEATH

Two rates of death were required for valuing pensions in the Health Department—the first covering deaths resulting from the actual performance of duty and the second covering other deaths. The rate of death from injuries sustained or disease contracted in the actual performance of duty ranks third among the rates for the four departments in which special benfits are allowed under such circumstances; lying between the rate for the Fire Department, which is higher, and for the Police Department, which is lower. The experience of the fund in this regard was incomplete and could be used only as indicative of certain tendencies of the rate and not as a mathematical forecast. The difficulties in deducing a rate and in supplementing the experience by that of other departments lay in the fact that many occupations of varying degrees of hazard are represented in the active force. As all pensions to dependents are based upon this rate, an effort was made to cover completely the future cost of such pensions by adopting a rate which will give the maximum number of deaths under this contingency that can be reasonably expected in the future. The experience seemed to indicate that the active force is exposed to deaths from causes connected

with the performance of duty at older ages than the active force of the Fire Department. The rate in the Health Department is lower than the corresponding rate of the Fire Department to approximately age 35. From this age it exceeds all other corresponding rates in the city service.

It was impossible to obtain comparative rates of much value from outside sources. For the purposes of rough comparisons, the statistics on accidental deaths during the years 1908-1909, published by the United States Bureau of Labor Statistics in Bulletin No. 157, were used. According to these figures the percentage which accidental deaths formed of deaths from all causes, was 4.7% among physicians and surgeons; 9.9% among laborers, and 5.9% among clerks. Approximately 48% of the total force in the Health Department are medical officers; 29% are grouped under the general heading of laborers, and the rest of the force is largely clerical. Approximately 10% of the total deaths of the Health Department are considered as being caused by injuries sustained or disease contracted in the actual performance of duty.

The rate of death from other causes was developed from the experience of the fund. It ranks third among the four such rates developed.

The two rates together form a total death rate for the Health Department which is the central one of the eleven death rates prepared; lying between that for the Police Department, which is higher, and that for the Fire Department, which is lower. It is the central rate, however, only until approximately age 55. From this age to about age 70 it does not increase as rapidly as do the other rates, with the exception of the rates for clerks and street cleaners, and consequently it drops from the central position to a position next to the lowest. Probably in this period employees who are physically less fit are leaving the service by retirement, as indicated by the comparatively high retirement rate, thereby reducing the mortality rate of the men who remain in active service.

RATE OF DISABILITY

Two rates of disability were required for valuing pensions for the Health Department, the first covering disability arising from causes connected with the actual performance of duty and the second covering disability from other causes. Disability arising from causes connected with the actual performance of duty is the only ground upon which employees with less than twenty years' service may be retired on pension. All cases of disability in the Health Department to date were reported as arising from such causes, therefore the experience could not be used as indicative of the other rate.

The rate of disability in the actual performance of duty exceeds all corresponding rates in the city service except that for the Police Department, and it is followed by the rate for the Fire Department. The rate of disability from causes not connected with the actual performance of duty was an adopted rate which resembles more closely in general trend a similar rate for men school teachers than it resembles any other rate for city employees. The rate as a whole is the lowest used for any of the four departments for which such a rate was required. It is somewhat higher to age 60 than corresponding rates developed from the experience of fraternal socie-

ties in Canada. In the development of this latter rate an attempt was made to exclude hazardous occupations from the experience and to eliminate all cases of temporary disability. While the rate for the Canadian societies increases beyond age 60, the rate for the Health Department decreases, as the experience indicates that at those ages retirements will probably be made under the service retirement benefit.

The two rates combined form an aggregate rate of disability which is, with the single exception of the one for men teachers, the lowest among the ten such rates prepared, the next higher being that applying to clerks in the City of New York Employees' Retirement Fund.

RATE OF SERVICE RETIREMENT

In comparison with rates of retirement for similar classes of employees in the city service, that adopted for the Health Department is high to approximately age 67, where it is exceeded by the corresponding rate among men school teachers. It does not increase rapidly from that age, and at age 78 is exceeded by the rate of retirement adopted for clerks under the City of New York Employees' Retirement Fund. The rate for the Health Department would seem to indicate that employees who do not retire in the age groups 45-60—that is, who do not retire when it is possible to adopt a new occupation or to practice privately, prefer to remain in the service beyond the time of eligibility for retirement. The rate considered as a whole up to age 65 stands fourth out of twelve rates developed, being exceeded by the corresponding rates for the firemen, policemen, and women teachers.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

The table on page 143 shows the rates used in the construction of all the pensioners' tables except that for dependents. A diagram showing the rates of mortality plotted on cross section paper is given on page 144.

DISABILITY PENSIONERS

Because of the small experience the death rate used for disability pensioners of the Health Department is an adopted one. As a whole it ranks about midway between the several rates of mortality developed for disability pensioners. The next higher rate is for firemen, while the next lower rate is for men teachers. The rate as adopted very nearly coincides with the corresponding rate for the Police Department from ages 40 to 60. From age 60 to age 70 it is similar to the rate for men school teachers, but it increases more rapidly than the later rate, and at age 75 exceeds Hunter's rate of death among disabled lives, which was adopted for the pensioners of the Supreme Court.

SERVICE PENSIONERS

The rate of death is lower for service pensioners of the Health Department than for the service pensioners of any other classes of the city employees, except the women school teachers. It is generally lower than McClintock's rate of death among annuitants, which was adopted as the rate of death for pensioners in the funds of the City College and of the Supreme Court.

TABLE 74—RATES OF MORTALITY AMONG PENSIONERS

Health	Department Per	sion Fund
--------	----------------	-----------

Age	Disability	Service	Age	Disability	Service
20	.1200	•••	61	.0474	.0223
21	.1157		62	.0503	.0240
22	.1110	• • •	63	.0535	.0258
23	.1067		64	.0570	.0279
24	. 1023	•••	65	.0608	.0299
25	.0982	• • •	66	.0659	.0323
26	.0944		67	.0692	.0348
27	.0906	• • •	68	.0739	.0377
28	.0869	•••	69	.0789	.0408
29	.0833	•••	70	.0843	.0439
30	.0800		71	.0909	.0479
31	.0765	•••	72	.0977	.0519
32	.0734	• • •	73	. 1050	.0565
33	.0704	• • •	74	.1135	.0619
34	.0673	• • •	75	.1220	. 0678
35	.0644	.0049	76	.1316	.0748
36	.0615	.0051	77	.1420	.0827
37	.0587	.0053	78	.1533	.0914
38	.0560	.0055	79	. 1655	.1014
39	.0533	.0058	80	. 1800	.1125
40	.0500	.0062	81	.1965	.1250
41	.0487	.0064	82	.2140	. 1387
42	.0465	.0067	83	.2340	.1547
43	.0444	.0071	84	.2560	.1710
44	.0425	.0074	85	. 2820	. 1890
45	.0408	.0077	86	.3100	.2100
46	.0393	.0083	87	.3450	.2330
47	.0381	.0087	88	.3860	.2560
48	.0371	.0003	89	.4280	. 2830
49	.0363	.0098	90	.4700	.3130
50	.0356	.0104	91	.5150	.3500
51	.0352	.0110	92	. 5600	.3940
52	.0350	.0118	93	.6100	.4460
53	.0353	.0126	94	.6640	.5150
54	.0358	.0134	95	.7260	.6140
55	.0365	.0144	96	. 7980	.7440
56	.0376	.0154	97	.8880	.9050
57	.0389	.0166	98	.9850	1.0000
58	.0405	.0178	99	1.0000	
59	.0424	.0192	100		
60	.0449	.0207	ll	1	

SERVICE AND MORTALITY TABLES AND SALARY SCALE The following tables are based on the rates discussed above:

TABLE 75—SELECT ACTIVE SERVICE TABLE AND SALARY SCALES

				Health D.	Health Department Pension Fund-Men	ion Fund-Mer				
							WITHDRAWALS	AWALS		
		LIV	Living			RESIGN	Resignations		Dismissals	Total Ultimate
V G	ê H	l(9)	1,5-31+3	s, (a)	'w(a)	rw(a) [5-1]+1	7 W(a) 1 p-21 + 3	7 tg (a)	6 (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	(a) A5
15	1,000,000	:	:		1 23,200		:	:	17,870	:
91	988,281	957,014	:	:	26,881	24,882	:	:	17,157	:
17	977,342	942,283	913,015	:	32,057	29,211	22,825	:	16,193	:
8	964,572	927,107	894,894	872,012	38,101	34,303	28,637	5,755	14,999	20,754
61	943,091	900,440	875,773	849,226	46,052	40,925	35,031	8,484	13,503	21,987
2 2	920,780	882,051	852,927	825,154	00,241	45,867	41,793	14,020	11,800	25,820
7 6	920,709	952,000	522,254	797,204	84,245	50,304	47,091	22,04I	10,234	32,925
7 6	910,052	623,997	789,838	702,090	110,842	50,032	52,129	24,387	8,878	33,205
3 3	910,002	794,119	750,874	720,018	130,590	00,353	55,252	24,990	7,702	32,098
† 4	900,309	704,051	723,835	160'160	104,053	04,183	57,183	25,039	0,054	31,093
3 5	699,717	733,395	000,011	057,731	187,141	02,100	58,042	24,790	5,801	30,597
9 6	550,270	704,479	058,192	024,838	203,844	70,800	57,723	24,309	S,001	29,430
7 8	901,100	075,050	020,294	593,084	209,202	72,905	50,993	23,783	4,419	28,202
9 6	932,529	045,110	595,305	502,521	210,030	73,500	55,904	23,120	3,001	100,72
1 6	010,100	010,510	202,400	533,110	200,204	73,074	54,237	22,300	3,401	72,707
3 5	707,909	500,022	535,912	504,902	204,280	73,305	52,519	21,509	2,979	24,400
1 6	732,021	200,200	500,121	477.957	197,495	72,015	20,012	20,040	420,2	23,272
	662,429	530,210	401,130	452,201	187.460	42,25	46,000	10,701	2000	7007
4	627.010	476.200	990.00	404.106	173 430	66,130	91077	13.00	184	10,739
35	501.030	450,200	406.501	281.051	162.228	62,490	41.686	17.025	1,581	18,616
36	555.418	424,685	383,503	360,800	151.007	50.456	30,164	16,146	1,404	17,550
37	520,052	300,588	361,306	340,505	141,104	56.142	36,600	15,220	1,233	16,453
38	484,194	375,105	339,663	320,953	129,280	52,590	33,969	14,282	1,088	15,370
30	449,813	351,309	318,910	302,119	118,301	49,148	31,413	13,384	296	14,351
\$:	415,288	328,051	298,700	284,036	106,729	45,435	28,795	12,441	852	13,293
4:	:	305,231	279,288	266,577	:	41,664	26,253	11,489	752	12,241
4	:	:	260,347	249,815	:	:	23,561	10,568	689	11,227
	:	:	:	233,691	:	:	:	9,628	584	10,212
‡ :	:	:	:	218,280	:	:	:	8,655	208	9,103
4 4	:	:	:	203,077	:	:	:	2,679	448	8,127
ę ;	:	:	:	199,889	:	:	:	0,551	395	0,040
4	:	:	:	177,059	:	:	:	5,258	347	5,005
\$ \$:	:	:	105,407	:	:	:	3,854	301	4,155
ţ	:	:	:	155,041	:	:	:	3,022	200	3,200
8				145,439	::	:	:	2,305	230	2,021

TABLE 75-SELECT ACTIVE SERVICE TABLE AND SALARY SCALES-Continued

	missels Ultimate	(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c								નું સું સું .	નું મું મું	ਜੇ ਜੇ ਜੇ ·	ਜੋ ਜੋ ਜੋ ⁻	- H H	- H H	- H H	- H H	ਜੋ ਜੋ ਜੋ [*]	- H H.	04 мин <i>с</i> м44 м с о н м м с а 4 м ч . - м 0 м о 4 м н	04 N N H C N 44 N C O H W N C 4	04NNH	04NNH	04NNH	04NNH	О4 МИН	о4 мин <i>с</i> м44 м с он м м с а 4 м ч. - м о о о о о о о о о о о о о о о о о о	о 4 мин с м 4 4 м с о н м м с и ч н ч . г м о м о м м н	о4 мин см44 мсон млси 4 м м. 2 м о м м м м м м м м м м м м м м м м м	о4 мин см44 мсон шмса 	о4 мин ⊳и44 м ⊳он ш м ⊳ и 4 м ч . 5 м о м м н	о4 мин ⊳и44 м ⊳он шиса ч ч ч ч . г ш о ∞ о 4 ш н	о 4 мин 6 м 4 4 м 6 м м м 6 м м м 6 м м м 6 м м м 6 м м м м 6 м
	Dismissals											мин	янин		нии	нии	нии	нии	нии	янин <u>;</u>	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	, ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	, ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	ниин ;;;;;;	янин ;;;;;;	янин ;;;;;;;	, ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	, ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	, ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	, ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	янин ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	ниин ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	ниин ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
		(e) (d) 2	1,917	i.c.	-	1,219		9200			H 200 20 4 2 0			1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	H H H H H H H H H H H H H H H H H H H			1 9 9 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	H		H CONWA	H 20 1 24 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	H O W M G I I I I I I I I I I I I I I I I I I	H O N W H O I I I I I I I I I I I I I I I I I I		H 20 R M 4	H OO WAY O :::::::::::::::::::::::::::::::::::	1 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	H	H 20 N M L	# B. B. B. B. B. B. B. B. B. B. B. B. B.	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	TIONS	rw(a) [3-3]+3	:			: :	:::		:::::	::::::																							
	RESIGNATIONS	*w(a)	:		:	: :	: : :			::::::	:::::::	:::::::																					
		7 W (8)	:	:	_	:	::	::::	:::::	::::::	:::::::																						
		, s. l	136,416		17,788	119,504	17,788 19,504 11,518	127,788 119,504 111,518 103,847	77,788 9,504 1,518 3,847 5,427	77,788 1,518 33,847 56,427 59,219	127,788 119,504 103,847 103,847 89,219 75,615	77,788 11,518 13,847 19,542 19,510 12,5015	7,788 11,518 11,518 13,847 10,447 10,447 10,210 13,448	7,788 10,504 10,504 10,504 10,447 10,447 10,285 10,285 10,483	7,788 10,504 10,504 10,518 10,519 10,519 10,28 10,28 11,53 11,53 11,53 11,53 11,53	127,788 (119,504 (11,5	27,788 19,504 19,504 96,427 96,424 75,62 75,53 63,24 63,24 77,45 71,73 71,73 71,73	7,788 9,504 1,518 1,518 6,427 5,204 7,248 7,453 11,936 11,936 11,78 11,78 11,78 11,78 11,78	24,788 26,71,0 26,71,0 26,71,0 26,71,0 26,71,0 27,1,0 28,1,0 2	27,788 19,504 19,504 19,504 10,504	7,7,88 19,504 19,504 19,518 19,219 19,285 11,745 11,788 11,788 11,788 11,746 11,788 11,041 11,641	7,7,88 10,504 10,504 10,504 10,417 10,216 11,004 11,78 11,041 11,041 11,041 11,041	7,788 19,504 19,504 19,504 19,118 19,219 11,00,28 11,78 11,78 11,78 11,78 11,64 11,64 11,64 11,64 11,64 11,64 11,64	7,788 10,504 10,504 10,504 10,504 10,504 10,504 11,788 11,788 11,788 11,788 11,788 11,641 11,788 11,641 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788 11,788	7,7,88 10,504 10,504 10,504 10,504 10,504 10,504 11,786	27,7888 27,7889 20,13,8419 20,184,09 20,184,09 20,184,09 20,184,09 20,185 20,1	7,7,88 19,504 10,504 10,504 10,504 10,504 11,788	7,7,88 10,504 10,504 10,504 10,504 10,504 10,504 11,78 11,64 11	7,7,88 10,504 10,504 10,504 10,504 10,504 11,004	7,7,88 10,5,004	7,7,88 10,504 10,504 10,504 10,504 10,504 10,504 10,504 11,788	7,7,88 10,500	7,7,7,8 1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
DNG		l(s)	:		:	::			· : : : : : : : : : : : : : : : : : : :	· · · · · · · · · · · · · · · · · · ·																							
LIVING		f[s-1]+1	:		:	::	:::		::::::	:::::::	::::::::	::::::::	:::::::::::::::::::::::::::::::::::::::																				
		(a)	:	:		:	::		:::::	::::::	:::::::	::::::::	::::::::	::::::::::																			
_			<u> </u>	_	_																												

TABLE 75-SELECT ACTIVE SERVICE TABLE AND SALARY SCALES-Continued

		DEATHS		SEPARA	SEPARATIONS BY DISABILITY	LITT	S L	Salary Scales for Valuing	for Valuing
	In Performance of Duty	Other	Total	In Performance of Duty	Other Causes	Total	Retirements	Contributions	Pensions
Yes	(a) Pa	(a) p	9,50	<u> </u>		<u>One</u>		H.	(A)
	(E)	((() () () () () () () () ()	1 (9)	(a)(A)	(E) N	(L) (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	<u> </u>	5(5-1)+1	5 6-13+1
	(e) P	(a)	(e) (e) (e) (e) (e) (e) (e) (e) (e) (e)					8+18-43r	5,5 5,8
15	n	1,766	1,768	148	:	148	:-	250	
2;	~ ;	1,791	1,798	162	:	. 162	:	300	:
<u> </u>	z:	1,792	1,807	178	:	178	:	345	:
9 2	Z 2	1,017	1,040	103	:	192	:	390	:
16	; ;	998	//017	0 20	:	200	:	0	:
32	⊋ 5	200.1	1,044	22.6		422	:	Sio	SO S
22		1,897	1,050	25.4		25.4		200	0 % 0 %
23	73	1,889	1,962	267	:	267	: :	735	208
ž	85	1,900	1,985	282	:	282	:	8	750
23	8	1,901	2,000	306	:	962	:	860	800
8	114	1,898	2,012	312	:	312	:	913	839
200	133	2001	2,034	327	:	327	:	96	875
38	182	288.1	2,050 2,050 8,000 8,000	343	:	343	:	1,000	016
9	323	1,857	2,080	377	: :	177		1,030	2 8
31	284	1,814	2,008	386	:	386	: :	8001	1.020
8	389	1,718	2,107	392	:	392	:	1,122	1,064
83	470	1,047	2,117	393	:	393	:	1,143	LILL
5 %	66,	1,020	2,122	300	:	390	:	1,163	1,187
3 6	25	1,032	2,135	100	:	301	: 3	081,1	1,272
37	984	1,652	2,138	300	: :	387	25.0	1,200	1,570
88	470	1,674	2,144	373	:	373	947	1,223	1,550
9	450	1,683	2,133	361	:	361	1,238	1,234	1,615
3:	427	1,703	2,130	340	:	340	069'1	1,243	1,672
: 4	204	1,730	2,130	330	:	330	2,053	1,250	1,712
1	200	1,740	2,123	313	:	313	2,401	1,258	1,742
3 1	340	1.780	2,100	28,00	: "	2000	2,793	1,200	1,773
45	201	1.700	3,000	300		100	200	70717	900
\$	262	1,808	2,070	260) e	263	3,551	1,261	2001
47	232	1,822	2,054	252	, 10	257	3,736	1,258	1,817
\$ \$	202	1,836	2,038	247	9	253	3,920	1,250	1,809
? 5	201	1,003	2,031	242	2 5	252	4,031	1,240	1,796
			2-26-			20.	- >0.484	77767	73/00

TABLE 75-SELECT ACTIVE SERVICE TABLE AND SALARY SCALES-Continued

Professions			DEATHS		SEPAR	SEPARATIONS BY DISABILITY	T. T. T. T. T. T. T. T. T. T. T. T. T. T		Salary Scales for Valuing	for Valuing
A		In Performance of Duty	Other Causes	Total	In Performance of Duty	Other Causes	Total	Service Retirements	Contributions	Pensions
1,016	AGE	6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6	6 (8) 6 (8) 6 (8) 7 (8) 7 (8) 7 (8) 7 (8) 6 (8) 6 (8)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(6) H 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	# + + + + • • • • • • • • • • • • • • • •	9.4	5 [2] 3[9-1]+1 3[9-2]+3 5-3]+3	s'El s'E-11+1 s'E-21+3 s's
1,0977 1,098 203 94 381 4,319 1,180 1,	51	87	816,1	2,005	217	39	256	4,243	1,215	1,735
433 1,884 1,997 1,997 1994 331 4,430 1,109 199 23 1,884 1,997 1,997 1994 331 4,430 1,109 199 23 1,885 1,897 1,998 195 1,998 195 1,109 199 199 1,109 1,	22	99	1,917	1,983	303	8 :	803 103	4.319	1,200	1,095
1,855 1,855 1,855 1,855 1,855 1,855 1,855 1,855 1,855 1,855 1,855 1,855 1,855 1,855 1,707 1,70	3 3	53	1,907	1,000	187	\$ 5	201	4.303	1,180	1,040
29 1,840 1,840 131 365 396 443 443 1,110	55	3 8	1.855	1.800	183	Š	386	4,351	1,146	1,527
23 1,770 1,733 105 319 444 4,128 1,170 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	8	6	1,820	1,849	131	265	396	4.339	1,128	1,468
1,087 1,077 33 444 444 4400 1,092 1,09	27	23	1,770	1,793	105	916	†2 †	4,283	1,110	1,413
13 1,595 1,501 25 445 445 45 45 45 45 45 45 45 45 45 45	8 9	2 Y	1,087	1,707	.33	371	‡ :	4,190	200,1	1,357
11. 1.393	38	13 6	1.407	1,011	S 48	844	457	100.5	1,061	1,354
1,284 1,293 443 1,184 4 4 43 1,184 4 4 43 1,184 4 4 43 1,184 4 4 43 1,184 4 4 43 1,184 4 4 43 1,184 4 4 43 1,184 4 4 43 1,184 4 4 8 8 1,184 1,18	15	7 2	1,303	1.404	21	450	465	3,871	1,050	1,210
7 1,177 1,184 4 499 413 3,584 1,030 H 1,081 5 873 898 83 888 83 8,584 1,024 H 1,024	62	٥	1,284	1,293	· «	435	443	3,734	1,040	1,168
1,075 1,081 2 380 3382 3463 4 1,024 1 1,025 1	8	_	1,177	1,184	•	0	413	3,584	1,030	1,134
973 973 973 973 973 973 973 973 973 973	\$ 4	۰ ۰	1,075	1,081	*	380	382	3,434	1,024	000,1
704 705 706 706 706 706 706 706 706 706 706 706	8 8	·	2000 2000 2000 2000	970		345	24.5 5.05 5.05 5.05	3,400	1,001	2,0,1
704 706 706 706 706 706 706 706 706 706 706	29		180	702		268	268	3,956	500	1,020
553 554 174 174 174 2,652 968 186 186 186 186 186 186 186 186 186 1	8	•	707	8	:	223	222	2,799	689	866
1 484 485 4 487 6 61 61 61 61 61 61 61 61 61 61 61 61 6	8	•	625	627	:	174	174	2,652	896	973
1 484 485 1 484 485 1 1 484 485 1 1 422 485 1 1 422 485 1 1 422 485 1 1 422 485 1 1 422 485 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2	H	553	554	:	130	130	2,504	950	953
1 421 422 60 00 2,323 888 888 888 888 888 888 888 888 888	7	-	4 8 4	485	:	93	83	2,371	933	934
303 303 303 303 303 303 304 40 40 40 40 40 40 40 40 40 40 40 40 4	22	H	421	422	:	%`	g`	2,232	610	917
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150 150 150 150 150 150 150 150 150 150	3 %	:	3 8	2 6	:	2 5	2 2	200	200	22
104	12	:	3 5	3 5				1,221	724	824
68 68 68 68 69 69 69 69 69 69 69 69 69 69 69 69 69	78		2.2	200		•	· •	420	713	8
41 41 42 43 44 44 44 44 44 44 44 44 44 44 44 44	2		89	89		• **	• •	979	299	788
23 23 529 529 529 529 529 529 529 529 529 529	8	:	7	17	:	-	H	387	621	769
12 12 529 529 529 529 529 529 529 529 529 52	2	:	23	23	:	:	:	207	573	749
2 2 2 4 487	82	:	12	12	:	:	:	66	\$29	730
	3	:	•	•	:	:	:	**************************************	487	710
	\$ 2	:	~	~	:	:	:	0	440	00

TABLE 76-SELECT ACTIVE SERVICE TABLE AND SALARY SCALE

			ORIAL				WITED	WITEDRAWALS			
						Resign	Resignations		Dismissale	Total Ultimate	
AGE	Đ.	l(=11+1	h(60) h(2-31+3	(a) #	(s) (s)	$^{r}w_{[p-1]+1}^{(a)}$	*w(**)	7 gg (d)	6 6 7 6 7 6 8 6 8 6 8 6 8 6 8 6 8 8 6 8 8 8 8	(9) M	
15	1,000,000	:	:	:	34,290	:	:	:	17,870	:	•
91	980,947	945,924	:	:	34,529	27,716	:	:	17,157	:	
17	965,255	927,301	899,091	:	38,610	29,674	8,901	:	16,193	:	LA
2	948,447	908,467	879,449	872,012	44.577	31,342	13,192	5,755	14,999	20,754	_
23	925,077	886,839	860,094	849,226	51,804	35,030	19,352	8,484	13,503	21,987	••
2	904,937	857,685	836,221	825,154	62,441	38,596	25,087	14,020	11,800	25,820	•
7 6	802,979	528,500	805,159	797,304	70,790	42,008	30,590	22,04I	10,284	32,925	Ŭ
7 6	882,739	203,710	774,091	702,090	88,539	40,015	30,382	24,387	5,578	33,205	
3 2	881,098	783,109	740,010	720,018	102,277	53,251	44,388	24,990	7,702	32,098	•
* 4	580,702	709,490	719,927	160'160	110,429	105,00	53,275	25,039	0,054	31,093	٠.
3 5	879,409	755,352	994,008	057,731	131,041	80,007	01,073	24,790	2,801	30,597	
9 5	871,540	740,331	202,138	024,838	140,420	93,282	612'00	24,309	2,001	29,430	S
3 8	858,398	717,741	039,004	593,084	100,778	99,048	70,303	23,783	4,419	28,202	•
8 8	842,257	000,840	011,913	502,521	173,505	100,803	72,512	23,120	3,881	17,001	
2 6	623,028	002,400	563,094	533,118	184,358	100,095	72,902	22,380	3,401	25,767	ИL
3 5	797,223	032,040	555,944	504,902	100,145	96,723	72,551	21,500	2,979	24,400	•
5 6	73,663	23,042	520,001	477,957	100,005	102,00	71,372	20,040	4,0,4	23.56	١٠١
8	26000	5/3/003	200,000	100,000	180.001	2/2/20	67,646	18,00	200	70000	
3	669	24,624	450.062	401 100	172.068	82,28	67.75	17.046	1284	10.722	_
35	625,235	485.447	426,553	181.051	164.427	78.642	61.627	17,035	1,481	18.616	U
8	\$85,466	456,691	402,698	360,800	153,302	73,527	58,270	16,146	1,404	17,550	
37	544,432	428,151	379,241	340,505	141,005	68,076	54,535	15,220	1,233	16,453	
88	503,475	399,664	356,322	320,953	128,386	62,148	50,598	14,282	1,088	15,370	
S	461,283	371,484	333,911	302,119	113,937	56,354	46,414	13,384	296	14,351	
\$;	419,416	343,885	311,669	284,036	128,66	50,379	41,764	12,441	852	13,293	
7	:	310,207	290,178	200,577	:	44,277	37,143	11,409	752	12,241	
7 9	:	:	200,770	249,815	:	:	31,984	10,508	000	11,227	
?;	:	:	:	233,001	:	:	:	020,0	200	212,01	
F	:	:	:	210,200	:	:	:	0,055	8.	9,103	
3	:	:	:	203,077	:	:	:	6/01/	4	7210	
2 \$:	:	:	109,889	•	:	:	0,551	395	0,040	14
} \$:	:	:	650'12'	:	:	:	5,250	347	500.5	•
\$ 4	:	:	:	105,407	:	:	:	3,054	301	4, 1. V. 00 V. 00	
P S	:	:	:	155,041	:	:	:	3,022	902	3,200	
3 5	:	:	:	145,439	:	:	:	2,305	062	2,021	
; \$:	:	:	130,410	:	:	:	7.10.1		411,	
5	:	:	:	20,77	:	:	:	450.1		1.189	
				10000				Arada		6-61-	١

TABLE 76—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

		LIV	Living				WITEDRAWALS	LAWALS		
### ### #### #### ####################						Resign	nations		Dismissals	Total Ultimate
111,518 103,847 90,429 80,439 80,439	977	/(=11+1) (a) /(5-2)+3	(e) 12	9 <u>H</u>	***(**)	7 (a) (a) (b) (a) (b) (a) (b) (a) (a) (a) (a) (a) (a) (a) (a) (a) (a	(a) (b)	6 4 6 4 6 4 6 4 6 4 6 4 6 4 6 4 6 4 6 4	10 (a)
103,847 103,847 103,847 103,847 103,847 103,846 103	:	:	:	111,518	:		:	920		
889,347 98,2457 98,2458 98,2458 99,	:	:	:	103,847	:	:	:	800	125	1,071
82,200 82,200 60,348 60,348 51,043	•	:	:	90,427	:	:	:	513	III	623
75,615 75,615 75,615 76,9285 76,9285 76,745 76,7	: :	: :	: :	82.26	:	:	:	357	97	454
699287 699287 774488 467,116 467,116 417,188 417,188 417,188 417,188 417,188 417,188 417,188 417,188 417,188 418,18	•	: :	: :	75,615	: :	:	:	218	8	303
6.5,248 4.6,716 4.6,716 4.6,716 4.6,716 4.6,716 4.6,000 1.5,504 4.6,000 1.5,504 1.5	:	:	:	69,285	: :	: :	•	6	z .	1/1
7.4.5.5 7.1.4.5.8 7.1.7.4.8.8 7.1.7.4.8.8.9.9 7.1.8.8.8.3 7.1.8.8.9.9 7.1.8.8.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9.9.9 7.1.9.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7.1.9 7	:	:	:	63,248	:	: :		7	40,	71
\$6.7936 \$41.786 \$41.786 \$41.786 \$41.786 \$41.746 \$41	:	:	:	57,453	:	:		•	25	S :
44.0.20 28.8.8.66 28.8.8.66 28.8.8.66 29.0.00 20.0.000 20.000	:	:	:	51,936	:	:	•	: :	}	4
37.17.00 32.8846 33.17.17.00 32.8846 33.17.00 32.00.00 33.00.00 33	:	:	:	40,710	:	:	:	:	3.5	5
1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	• ;	:	:	41,788	:	:	:	:	200	2 6
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	: :		:	37,174	:	:	:	:		7
25,094 15,464 15,464 10,278 10,278 10,000	: :			28,040	:	:	:	:	_	
1, 2, 4, 5, 4, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,	:	:	:::	25,004		:	:	:	8	. "
15,504 10,2784 10,278 10,278 15,501 15,501 15,7 15,7 15,7	:	:	:	21,641		:	:	:	:	:
15,50 10,70 10,20 10,000 10,0	:	:	:	18,453	:			:	:	:
10.00 10	:	:	:	15,504	:	:		:	:	:
10,278 2,0088 2,012 8,5012 8,5012 1,5012	:	:	:	12,784	:	:			:	:
1, 2, 4, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,	:	:	•	10,278	:	:	:	: :	: :	:
0.00, 4, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,	:	:	:	2,088	:	:	:	: :		:
1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	•	: :	•	5,910	:	:	:	:	:	: :
H & & & & & & & & & & & & & & & & & & &	: :		•	2,4	:	:	:	:	:	:
THE STATE OF THE S	:			1.620	:	:	:	:	:	:
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1 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	:	:	:	387	: :	:	:	:	:	:
	:	:	:	151	: :	:	:	:	:	:
	:	:	:	22		:	:	:	:	:
	:	:	:	13		:	:	:	:	:
	:	:	•	-	: :	•	:	:	:	:
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	:	:	:	:	:	: :		:	:	:
	:	:	:	:	:			:	:	:
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	:	:	:	:	:	:	: :	: :	:	:

TABLE 76—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued
Health Department Pension Fund—Women

Principates			DEATES		#S	SEPARATIONS BY DISABILITY	BILITY		SALARY SCALES	SALARY SCALES FOR VALUING	1
The state of the		In Performance of Duty	Other Causes	Total	In Performance of Duty	Other Causes	Total	Retirements	Contribution	Pensions	ı
The state of the	AGE	6 (3) (8)	(a) (a)	<u> </u>	<u> </u>		ê. 1 €. 1		E	S [x]	١
The control of the		(3-1)+1	6,7(6)	(7.11+1 (6)1+1	(*1]+1 (*(*)	• (r (a)	(4) (4) (6) (6) (7)	0 r (a)	5(3-1)+1	5 [2-1]+1	
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,		2(2)+3 2(3) 2(3)	(x-2)+2	$a_{(x-2)+3}^{(x-2)+3}$	# (5-2) + 3 # (5-2) + 3 # (5-2)	•	(x-2)+2 (x-2)+3	•	5 _{[x} -2]+3	S (12-21)+2 S / 2	
7 1,701 1,702 1,703 1,70	15	,	- yyu .	894.	0,5						ı
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	2		1,700	1,708	140	: :	148	:	250	:	
1.8	17	ış	1,702	1,807	178		178	: :	346		
31 1,866 1,687 208<	e	23	1,817	1,840	192	:	102		000	: :	
51 1,800 1,900 234<	2 6	31	1,846	1,877	308	:	208	:	9	:	
63 1,694 2,38 2,38 2,38 6,59 6,59	3 5	Q ;	1,866	1,906	224	:	224	:	\$10	ŞoŞ	
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	2 2	15.0	1,894	1,945	238	:	238	:	. 583	578	
85 1,900 1,985 287 287 287 287 287 288<	8	3 6	1,007	1,959	40.0	:	254	:	003	048	
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	*	°.∞°	000,1	1,084	200		282	:	735	9 2	
114 1,896 2,034 312	33	8	1,901	2,000	962	: :	90	: :	88	% % % %	
132 1,992 2,034 337 153 1,992 2,036 3,01 153 1,992 2,036 3,01 154 1,886 2,036 3,01 155 1,986 2,036 3,01 157 2,036 3,01 158 1,857 2,036 3,01 158 1,184 2,036 3,01 158 1,184 2,036 3,01 158 1,134 3,02 158 1,134 3,03 158 1,134 3,03 158 1,136 2,132 3,01 158 1,136 2,132 3,01 158 1,136 2,132 3,01 158 1,136 2,132 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,133 3,01 158 1,136 2,013 2,013 158 1,136 2,013 2,013 158 1,131 2,013 2,013 158 1,131 2,013 2,013 158 1,131 2,013 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 158 1,131 2,013 2,013 158 1,131 2,013 2,013 158 1,131 2,013 2,013 158 1,131 2,013 2,013 2,013 158 1,131 2,013 2,013 2,013 158 1,131 2,013 2,013 2,013 2,013 158 1,131 2,013 2,013 2,013 2,013 158 1,131 2,013 2,013	9 :	114	868,1	2,012	312	:	312	:	913	839	
15.3 1,896	7 8	132	1,902	2,034	327	:	327	:	96	875	
223 1,857 2,000 372 1,000 373 1,857 1,000 1,047 2,117 393 1,100 392 1,100 392 1,100 392 1,100 392 1,100 392 1,100 392 1,100 392 1,100 393 1,100 39	8	153	000,1	2,0 0,0 0,0 0,0 0,0 0,0	343	:	343	:	000,1	016	
284 1,814 2,098 386 386 1,000 400 1,647 2,117 392 392 1,123 400 1,647 2,117 393 392 1,143 400 1,632 2,122 393 392 1,144 400 1,632 2,133 393 391 1,144 480 1,653 2,133 387 337 1,130 480 1,674 2,134 373 373 1,130 470 1,674 2,134 373 373 1,130 470 1,674 2,134 373 373 1,130 470 1,703 2,133 373 373 1,243 470 1,704 2,133 330 346 470 1,703 2,133 330 346 470 1,704 2,133 330 346 470 1,704 2,113 3,100 360 <tr< th=""><th>8</th><th>223</th><th>1,857</th><th>2,080</th><th>377</th><th>: :</th><th>301</th><th>: :</th><th>1,030</th><th>240 080</th><th></th></tr<>	8	223	1,857	2,080	377	: :	301	: :	1,030	240 080	
389 1,718 2,107 392 393 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,143 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,144 1,143 1,143 1,144 <th>31</th> <th>284</th> <th>1,814</th> <th>2,098</th> <th>386</th> <th>:</th> <th>386</th> <th>:</th> <th>1,008</th> <th>1,020</th> <th></th>	31	284	1,814	2,098	386	:	386	:	1,008	1,020	
470 1,047 2,117 393 393 393 394 1,163 2,118 2,118 1,163 1,163 1,163 1,163 1,163 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,180 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190 1,190	25	389	81,718	2,107	392	:	392	:	1,122	1,064	
593 1,633 2,135 391 1,633 2,135 392 1,633 2,135 391 1,633 2,138 382 499 1,633 2,138 382 499 1,633 2,138 382 499 1,633 2,138 382 490 1,683 2,138 3,13 3,13 3,13 3,13 3,14 3,13 3,13 3,14 3,13 3,13	3 %	470	1,047	2,117	393	:	393	:	1,143	711,1	
499 1,033 2,133 3,87 387 235 1,200 1,033 2,133 3,887 388 2,133 3,887 388 2,133 3,887 388 2,133 3,887 3,133 3,134 2,133 3,134 2,133 3,134 2,133 3,134 2,133 3,134 2,133 3,134 2,133 3,134 2,133 3,134 2,133 3,134 2,053 1,234 1,236	35	203	1,632	2,122	101	: :	390	:	1,103	1,107	
486 1,652 2,138 382 382 470 1,074 2,133 361 1,233 1,233 470 1,074 2,133 361 1,083 2,133 361 1,094 1,223 1,234 4,202 1,703 2,133 361 1,094 1,234 1,234 4,202 1,748 2,123 3,130 2,035 1,248 1,748 2,123 3,130 2,035 1,249 1,250 1,260 1,	ဗ္ဗ	466	1,633	2,132	387		387	235	1,200	1.170	
470 1,074 a,144 373 373 373 947 1,223 424 450 1,083 a,134 301 346 1,094 1,223 445 1,093 a,136 3,139 3,139 346 1,090 1,243 1,243 3,139 2,123 3,139 2,123 3,139 2,123 3,139 2,123 3,139 2,123 3,139 2,123 3,139 2,123 3,139 2,123 3,139 2,123 3,139 2,123 3,139 2,125 2,123 3,139 2,125 2,12	37	486	1,652	2,138	382	:	382	579	1,212	1,468	
43.0 1,033 2,133 3,01 301 1,238 1,234 4,243	9 8	470	1,074	2,144	373	:	373	947	1,223	1,550	
402 1,750 1,750 1,250 3,30 1,250 3,40 1,748 3,100 2,053 1,250 3,40 1,748 3,100 2,053 1,250 3,50 1,762 2,110 2,050 2,090	3	450	1,003	2,133	301	:	301	1,238	1,234	Sio'i	
375 1,748 2,123 313 3.461 1,258 348 1,762 2,110 296 2,110 296 2,100 282 291 1,262 2,100 282 291 1,262 2,100	7	402	1,736	2,138	330		330	2.053	1,240	1,012	
348 1,762 2,110 296 296 2,793 1,262 291 1,262 291 1,262 291 1,790 2,090 262 291 1,262 291 1,790 2,090 262 291 1,790 2,090 260 2,090 3 272 3,290 1,262 202 1,808 2,070 262 3,290 1,262 2,090 262 1,803 2,091 242 1,803 2,019 242 1,903 253 2,019 2,	4	375	1,748	2,123	313	:	313	2,461	1,258	1,742	
310 1,780 2,100 282 2 284 3,056 1,262 291 1,799 2,090 2,090 269 3 272 3,299 1,262 202 1,999 2,090 269 3 2,72 3,399 1,262 2,090 260 1,896 2,090 260 3 2,551 1,861 2,090 2,000 2	2:	348	1,762	2,110	906	:	962	2,793	1,260	1,773	
291 1,799 2,090 3 272 3,299 1,262 262 1,262 253 1,262 253 1,262 253 1,262 253 2,551 1,262 253 2,070 200 3 260 3 3,551 1,262 203 1,263 2,034 242 10 252 253 3,920 1,250 1	;;	320	1,780	2,100	700	~	284	3,056	1,262	1,790	
232 1,822 2,054 252 5 3,551 1,201 2,32 2,33 2,554 2,52 2,33 2,554 2,52 2,53 2,554 2,	. 4	201	1,799	2,090	8	m :	272	3,299	1,262	1,806	
202 1,836 2,038 247 6 253 3,920 1,25	47	223	1 833			9 2	2 5	3,354	1,201	1,01	
168 1,863 2,031 242 10 252 4,031 1,240 1,2	4	202	1,836	2,038	247	200	253	3,730	1,250	1.800	
124 1,895 2,019 231 22 253 4,130 1,228	\$:	891	1,863	2,031	243	2	252	4,031	1,240	1,796	
66 1,917 1,983 203 60 253 4,243 1,215 1,000 1,000 1,20	3:	124	1,895	2,019	231	22	253	4,130	1,228	1,768	
1.007 1.007 1.000 1.200	7 5	84	816,1	2,005	217	30	256	4,243	1,215	1,735	
	3 23	3 2	1,917	1,963	203	8 8	203	4,319	1,200	1,095	

TABLE 76—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

In Performance Other Causes Total	In Performance of Duty	0 - 100	Total	Retirements		
43		Other Causes			Contribution	Penalons
1,884 1,885 1,855 1,687 1,687 1,595 1,595 1,177 1,177 1,177 1,177 1,177 1,177 1,177 1,177 1,177 1,184 1,192 1,192 1,192 1,192 1,192 1,192 1,193 1,194 1,	2 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	8 8	6 H 6 4 7 7 7 7 4 4 4 4 4 4 4 4 4 4 4 4 4 4	e d	5 [2] 5 [2-1]+1 5 [2-2]+3	20, 20, 20, 20, 20, 20, 20, 20, 20, 20,
43 1.884 35 1.855 23 1.770 1.702 1.5687 1.5687 1.703 1.10497 1.703 1.704 4 84 4 84 1.1044	*		H		**	
35 1,855 1,800 10 1,000 11 1,000 11 1,000 11	170	143	313	4,360	1,163	1,588
23 1,770 1,940 11 1,595 11 1,770 1,793 11 1,793 11 1,793 11 1,793 11,793 11,794 11,293 11,494 11,293 11,494 11,293 11,494 11,293 11,293 11,494 11,293	153	203	350	4,351	1,146	1,527
11 1,595 11 1,595 11 1,595 11 1,595 11,193 11 1,497 11,193	131	205	300	4,339	1,128	1,408
113 11393 11,500 1,510 1	Ç.	210	474	20,4	2,11	1,413
133 1,139	5,5	3/1	* .	4,190	7,00	1,357
13 1,510 1,393 1,1494 1,1393 1,1404 1,177 1,184 1,184 1,184 1,177 1,184	33	2 0	754	20,0	0,0,1	1,304
1,393 1,1394 4 4 1,1394 1,075 1,075 1,075 1,081 1,1393	7 .	9 4	472	3,904	1,003	1,255
1,1204 1,177 1,1804 2	Z.	450	405	3,071	1,050	012,1
1,017 1,017 2 2 3 709 2 3 7004 2 3 3 6 2 3 3 6 2 3 3 6 2 3 3 6 2 3 3 6 2 3 4 6 8 5 1 1 2 3 1 1 2 3 1 2 3 1 2 4 4 8 5 1 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	•	435	443	3,734	1,040	1,106
2 2 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	* •	5,6	413	3,504	1,030	1,134
6 4 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	N	9 .	305	3,434	1,024	1,099
789 789 789 789 789 789 789 789	:	24. V 9.	8. 8. 6. 8. 6.	3,200	010,1	0,070
6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	:	3 %	9 %	221.5	8 8	2,045
625 626 626 626 626 626 626 626	•	9 6	9 6	2,500	£	2,020
5553 1 4 484 4 484 4 485 3 3 6 2 3 3 3 6 3 3 3 6 3 3 3 3 5 5 5 5 5 5 5 5		174	174	2.652	3,00	2,50
4 4 4 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	: :	130	130	2,504	0.00	679
2 4 4 1 2 3 3 4 4 4 1 2 3 3 4 4 4 1 1 2 3 3 4 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 4	:	63	6	2,371	933	034
362 306 306 306 100 100 100 100 100 100 100 1	:	99	8	2,232	913	616
306 252 253 100 100 100 110 110 110 110 11	:	ę	9	2,007	88	8 0
253 253 150 104 68 41 68 68 68 68 68 68 68 68 68 68 68 68 68	:	31	31	1,953	863	90 v
150 164 168 688 41 84 6 688 6 688 7 100 1	:	0 :	2 :	1,005	933	903
10.0 6.8 4.1 6.8 4.1 6.8 6.8 6.8 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0	:	3 *		1,000	8:	4 ,
4 4 6 6 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	:	•	•	1,351	/2/	0 0 0
23 1 23 4 1 2 2 3 1 1 1 2 3 1	. ;	• «	• «	4.70	547	8
# # # # # # # # # # # # # # # # # # #	:		H	387	621	92
* :::::::	:	:	:	207	573	749
• • • • • • • • • • • • • • • • • • • •	:	:	:	93	529	730
::::::	:	:	:	35	487	710
:::::	:	:	:	•	4	603
::::	:	:	:	H	416	699
:::	:	:	:	:	:	:
::	:	:	:	:	:	:
:	:	:	:	:	:	:
	:	:	:	:	:	:
	:	:	:	:	:	:
	:	:	:	:	:	:

TABLE 77—DISABILITY PENSIONERS' MORTALITY TABLE

Age	Living l(f)	Dying $d_{s}^{(i)}$	Age	Living (6)	Dying d (f)
20	1,000,000	120,000	59	80,458	3,411
21	880,000	101,816	60	77,047	3,460
22	778,184	86,378	61	73,587	3,488
23	691,806	73,816	62	70,099	3,526
24	617,990	63,220	63	66,573	3,561
25	554,770	54,479	64	63,012	3,592
26	500,291	47,227	65	59,420	3,613
27	453,064	41,048	66	55,807	3,678
28	412,016	35,804	67	52,129	3,607
29	376,212	31,339	68	48,522	3,586
30	344,873	27,589	69	44,936	3,545
31	317,284	24,273	70	41,391	3,489
32	293,011	21,507	71	37,902	3,446
33	271,504	19,114	72	34,456	3,366
34	252,390	16,985	73	31,090	3,264
35	235,405	15,160	74	27,826	3,159
36	220,245	13,545	75	24,667	3,009
37	206,700	12,134	76	21,658	2,850
38	194,566	10,895	77	18,808	2,671
39	183,671	9,790	78	16,137	2,474
40	173,881	8,851	79	13,663	2,261
41	165,030	8,037	80	11,402	2,052
42	156,993	7,300	81	9,350	1,838
43	149,693	6,646	82	7,512	1,607
44	143,047	6,080	83	5,905	1,382
45	136,967	5,588	84	4,523	1,158
46	131,379	5,163	85	3,365	949
47	126,216	4,809	86	2,416	749
48	121,407	4,504	87	1,667	575
49	116,903	4.244	88	1,092	421
50	112,659	4,010	89	671	287
51	108,649	3,825	90	384	180
52	104,824	3,669	91	204	105
53	101,155	3,570	92	99	56 26
54	97,585	3,494	93 94	43	20 12
55	94,091	3,434	95	17	
56 57	90,657	3,409	95	5	4
57 58	87,248	3,394	11	1	I
38	83,854	3,396	··		• • •

TABLE 78-SERVICE PENSIONERS' MORTALITY TABLE

Health Department Pension Fund

Age	Living l ^(y)	Dying $d_{s}^{(g)}$	Age	Living (9)	Dying $d_{s}^{(g)}$
35	235,405	1,153	67	152,576	5,310
36	234,252	1,195	68	147,266	5,552
37	233,057	1,235	69	141,714	5,782
38	231,822	1,275	70	135,932	5,967
39	230,547	1,338	71	129,965	6,225
40	229,209	1,421	72	123,740	6,422
41	227,788	1,458	73	117,318	6,628
42	226,330	1,516	74	110,690	6,852
43	224,814	1,596	75	103,838	7,040
44	223,218	1,652	76	96,798	7,240
45	221,566	1,706	77	89,558	7,40
46	219,860	1,825	78	82,151	7,500
47	218,035	1,897	79	74,642	7,560
48	216,138	2,010	80	67,073	7,546
49	214,128	2,098	81	59,527	7,441
50	212,030	2,205	82	52,086	7,224
51	209,825	2,308	83	44,862	6,940
52	207,517	2,449	84	37,922	6,485
53	205,068	2,584	85	31,437	5,942
54	202,484	2,713	86	25,495	5,354
55	199,771	2,877	87	20,141	4,693
56	196,894	3,032	88	15,448	3,95
57	193,862	3,218	89	11,493	3,253
58	190,644	3,394	90	8,240	2,579
59	187,250	3,595	91	5,661	1,982
60	183,655	3,802	92	3,679	1,450
61	179,853	4,011	93	2,229	. 995
62	175,842	4,220	94	1,234	636
63	171,622	4,428	95	598	368
64	167,194	4,665	96	230	172
65	162,529	4,860	97	58	54
66	157,669	5,093	98	4	4

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following tables are based on an entrance salary of \$1,000 and show the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 120. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary.

Table 79—present value of average total future salary to be received by entering members, AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS, PAYABLE TO THESE MEMBERS AND THEIR FAMILIES, BASED ON AN ENTRANCE SALARY OF \$1,000 FOR VALUES DETERMINED BY SALARY, AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY

	Pensions to Dependent Parents of	Members Dying in Performance of Duty	# # # # # # # # # # # # # # # # # # #
	Pensions to Children of Members	Dying in Performance of Duty	**************************************
	Pensions to Widows of Members	Dying in Performance of Duty	\$10 50 50 50 50 50 50 50 50 50 50 50 50 50
		From Ordinary Causes After 20 Years Service	\$12 9 10 13
ERS	UPON DISABILITY	In Performance of Duty	44 47 55 55 58 58
PENSIONS TO MEMBERS		Total	60 60 60 60 69
PR		Upon Service Retirement	\$664 446 416 441 498
		Total	\$751 \$06 476 \$09 \$67
	Total of All Pension	Benefits	\$770 531 507 542 598
	Total Future	Salary	\$17,853 9,792 7,448 6,595 6,265
	AGE	ENTRANCE	\$\$ 88 \$\$ \$\$

Total Future Salary Estimated without use of etls column, which was used to obtain cost of Service Pension only.

156 SECTION II

TABLE 80—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS PAYABLE TO THESE MEMBERS AND THEIR FAMILIES, BASED ON AN ENTRANCE SALARY OF \$1000, FOR VALUES DETERMINED BY SALARY AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY

Health Department Pension Fund-Women

					PENSIO	из то Мемве	RS	Pensions to
AGE AT	*Total Future	Total of all				UPON DISA	BILITY	Dependent Parents of Members
ENTRANCE	Salary	Pension Benefits	Total	Upon Service Retirement	Total	In Performance of Duty	From Ordinary Causes After 20 Years Service	Dying in Performance of Duty
20	\$18,221	\$772	\$770	\$68o	\$90	\$77	\$13	\$2
25	10,063	520	517	456	Ğι	52	ا و ا	3
30	7,275	462	459	401	58	48	10	3
35	6,339	482	480	416	64	52	12	2
40	6,253	564	561	493	68	57	11	3

*Total Future Salary Estimated without use of $^{orl}_S$ Column, which was used to Obtain Cost of Service Pension only.

The following table shows the expectations of life of pensioners of various ages, together with the annuity values based on the mortality tables, which were used in valuing pensions:

TABLE 81—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY AND SERVICE PENSIONERS

	ANNUITY VALUE	Y VALUE	EXPECTATION	EXPECTATION OF LIFE		ANNUIT	ANNUITY VALUE	EXPECTATION OF LIPE	on of Life
AGE	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners	AGE	Disability Pensioners	Service Pensioners	Disability Pengloners	Service Pensioners
20	7.39	:	11.59	:	59	16.8	11.64	12.03	17.01
21	7.65	:	12.11	:	8	8.63	11.32	11.54	16.34
22	7.9	:	12.63	:	19	8.30	10.00	11.06	15.67
23	8.16	:	13.14	:	62	80°.0	10.65	10.58	15.03
*	8.42		13.65		8	7.80	10.32	11.01	•
	000	:		:	3	3		199	70.4
3 4	00:00	•	14.15	:	5 6	7.52	8.5	6.0	13.74
97	o.03	:	14.03	:	3	7.24	9.08	9.21	13.12
7.7	9.18	:	15.11	:	8	96.9	9.31	8.78	12.51
78	9.43	:	15.56	:	67	69.9	8.96	8.30	10.11
2	0.67		16.00		89	6.42	8.63	7.04	11. 22
30		· ·	9.		9		o o		
3 6	3	:	94.94	:	5 6		0.10	40.7	2,5
10	10.13	:	10.79	:	2 :	2.89	7.93	7.14	10.18
77	10.34	:	17.14	:	77	5.01	7.58	0.75	9.63
33	10.55	:	17.45		72	5.34	7.24	6.38	8
34	10.74	:	17.74	:	73	80.	6.80	9.01	8.50
¥.	200	or the	o		7.			99	
9		11:01	200	40.00		30.1	40.0	9 9	4.
2 6	80:11	17.90	10.10	34.71	2 :	4.50	0.20	5.33	7.54
ر د	11.22	17.09	18.34	33.89	2	4.33	٠	4.9	7.05
9	11.35	17.47	18.46	33.06	7.1	% •	5.52	4.67	6.58
30	11.45	17.25	18.52	32.24	78	3.84	8.19	4.30	6.12
\$	11.53	17.02	18.54	21.43	2	19.61	4.87	8.4	2.60
41	11.69	16.70	02 62	2000	S	2 2 2 2	. 7	2 77	200
42	69	A 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			3 2	75.5	; ·	•	
2 5		10.55	10.43	20.02	5 6	41.5	4	3.40	•
2:	11.03	10.31	19.30	29.0I	79	2.03	3.97	3.21	4.51
\$:	10.11	10.00	18.13	28.22	3	2.70	3.09	2.95	4.15
4	11.57	15.80	16.71	27.42	Z	2.49	3.42	2.70	3.82
\$	11.50	15.53	17.65	26.63	82	2.20	3.17	2.46	3.51
47	11.41	15.27	17.35	25.85	8	3.00	2.02	2.23	3.21
84	11.20	14.00	17.03	20.25	82	1 80	,,,	, 0	202
9	91 11	***	29.91	70:50	: a		,		3,5
2		-/	20.01	24.50	3 8	***	2	20.1	3 !
3:	3.	14.43	10.20	23.54	8	1.54	2.24	I.02	2.41
7	10.83	14.14	15.85	22.78	3	1.40	2.03	1.40	2.10
25	10.63	13.84	15.41	22.03	16	1.26	1.82	1.31	1.92
ន	10.42	13.54	14.95	21.29	8	1.13	97.1	1.17	1.68
54	10.10	13.23	14.47	20.55	ස	10.1	1.40	1.03	1.45
55	0.04	12.03	13.00	10.82	š	200	8 T T	-	1.22
20	0.70	12.61	13.50	10.11	8	.02	0,	2.	8
7.			10.01	i C	8	·		?	
3 2	200	6		10.40	2 5	:	? (:	: ; _
	_								

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 82—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Health Department Pension Fund

Age	м	EN	Wor	MEN	Total Number at	Total Salaries at
	Number	Salaries	Number	Salaries	Indicated Age or Above	Indicated Age or Above
16	3	\$900			1,262	\$1,284,230
17	2	780	1	\$240	1,250	1,283,330
18	2	780		• • •	1,256	1,282,310
19	8	3,840	1	360	1,254	1,281,530
20	15	8,400	2	580	1,245	1,277,330
21	15	7,680	2	720	1,228	1,268,350
22	16	9,600	1	600	1,211	1,259,950
23	9	6,720	r	750	1,194	1,249,750
24	9	6,900	4 6	3,300	1,184	1,242,280
25	10	7,770		4,500	1,171	1,232,080
26	10	9,980	9	5,700	1,155	1,219,810
27	14	12,960	4	2,070	1,136	1,204,130
28	18	19,110	7	5,340	1,118	1,189,100
29	18	18,550	19	15,100	1,093	1,164,650
30	13	14,670	14	9,780	1,056	1,131,000
31	27	27,540	14	12,150	1,029	1,106,550
32	30	34,370	10	7,350	988	1,066,860
33	21	24,800	18	15,850	948	1,025,140
34	33	38,600	22	19,740	909	984,490
35	31	36,500	18	14,850	854	926,150
36	28	33,320	19	16,410	805	874,800
37	35	40,920	17	13,350	758	825,070
38	26	34,980	20	17,970	706	770,800
39	35	44,620	12	9,570	660	717,850
40	38	51,020	19	18,600	613	663,660
41	39	44,690	17	18,180	556	594,040
42	35	40,580	12	10,800	500	531,170
43	23	23,790	15	9,810	453	479,790
44	25	29,990	13	10,050	415	446,190
45	28	34,720	11	9,590	377	406,150
46	18	23,220	10	7,800	338	361,840
47 48	25 16	31,810	6	5,160	310	330,820
48 49	18	22,620	12	7,230	279	293,850 264,000
50		28,350	9	4,510	251 224	
50 51	15	17,670 17,180	6	7,440	198	231,140 206,030
51 52	13	17,160		5,340 5,280	170	183,510
53	10	0,420	7 8	6,460	161	165,010
54	20	22,860	3	2,640	143	149,130
55	13	16,000	5	3,810	143	123,630
56	15	15,600) I	3,010	102	102,830
57	12	12,760	3	1,950	86	86,780
58		5,750	3	900	71	72,070
59	5 6	6,120	ī	360	65	65,420
60	5	6,380	ī	360	58	58,940
61	9	8,320	ī	1,800	52	52,200
62	7	8,250			42	42,080
63	3	1,800	r	600	35	33,830
			<u> </u>			1

TABLE 82—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE—Continued

Health Department Pension Fund

AGE	м	en	Wo	MEN	Total Number at	Total Salaries at
	Number	Salaries	Number	Salaries	Indicated Age or Above	Indicated Age or Above
64	2	\$1,320			31	\$ 31,430
65	1		1	750	29	30,110
66	7	7,890			28	29,360
67	3	2,850	l I		21	21,470
68	l ă	4,670			18	18,620
69	3 4 1 2	1,200	l		14	13,950
70	2	2,400	l		13	12,750
71	3	3,000	l		11	10,350
72	3 2	1,800	l		8	7,359
73	3	3,720	l		6	5,559
74	1	· · · ·	l		3	1,830
75		• • •	l		3	1,830
76	1	750	l		3 3 3 2	1,830
77	1	,,,	1		2	1,080
78	1			• • •	2	1,080
79				• • •	2	1.080
80	ī	600			2	1,080
81	l . <u>.</u>				I	480
82		l			ī	480
83		l			I	480
84	i i	480		1	ī	480

TABLE 83—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Health Department Pension Fund

TOTAL SERVICE	м	BN	Wo	MOENT	Total Number of Employees	Total Salaries of Employees
YEARS	Number	Salaries	Number	Salaries	Having Indicated Service or More	Having Indicated Service or More
0	10	\$10,700	5	\$2,560	1,262	\$1,284,230
1	49	47,070	19	14,580	1,247	1,270,970
2	57	51,510	31	20,400	1,179	1,209,320
3	39	39,900	16	12,010	1,001	1,137,410
4	57	48,970	65	52,500	1,036	1,085,500
2 3 4 5 6 7	30	32,800	19	13,740	914	984,030
6	71	75,720	31	26,350	865	937,490
7	64	65,490	37	34,230	763	835,420
8	83	80,850	43	33,540	662	735,700
9	41	42,880	31	22,710	536	621,310
10	59	59,040	25	16,120	464	555,720
11	46	54,330	21	17,190	380	480,560
12	35	37,550	17	17,010	313	409,040
13	18	21,380	3	3,940	261	354,480
14	17	18,600	5 2	3,930	240	329,160
15	27	35,300		1,650	218	306,630
16	51	72,840	9 5 2	7,440	189	269,680
17	16	22,370	5	4,520	120	180,400
18	25	38,960	2	2,400	108	162,510
19	26	39,220	5	6,420	81	121,150
20	15	20,100	I	300	50	75,510
21	10	16,820	1		34	55,110
22	6	8,520	1		24	38,290
23			r	1,500	18	29,770
24	I	2,550			17	28,270
25	1	1,500	1	300	16	25,720
26	1	1,050	1		14	23,920
27	4	7,100			13	22,870
28	2	4,350		1	9	15,770
29	2	6,050			7	11,420
30 & over	4	4,650	1	720	5	5,370

TABLE 84—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE.

Health Department Pension Fund

Age	Number	Pensions	Age	Number	Pensions
35	1	\$450	60	2	\$1,200
40 41	ı	\$450 360 680	73	I	450
45	i	900	Total Men	7	\$4,730
47	ı	1,050	Total Women	1	\$4,730 360
		1	Grand Total	8	\$5,090

TABLE 85—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE

Age	Number	Pensions	Age	Number	Pensions
39	I	\$1,280	64	4	\$3,150
40	1 1	750	65	i	900
41	1 1	450	66	2	1,950
42			67		1,350
43	1		68	2 I	1,050
44	1 1	750	69	1	600
45	2	1,200	70	1 2	1,050
46			71		900
47	5	8,530	72	5 1	5,580
48	5 2	2,500	73	1 1	1,200
49	2	1,500	74	l	1
50	1 1	1,280	1 75		1
51	3	2,700	76		1
52	3 2	960	77	l	l
53	- - -	3,600	78	1	
54	4	3,220	79		1
55	Ì	3,700	80	1	600
56	2	2,250	81		
57	7	6,000	82	1	
58	1 3	3,150	83	1	390
59	3	830	1		·
60	4	2,780	Total Men	71	\$68,180
61	i	900	Total Women	2	1,350
62	2	2,480			-
63	l	l ::	Grand Total	73	\$69,530

TABLE 86—NUMBER AND PENSIONS OF ALL PENSIONED DEPENDENTS CLASSIFIED BY AGE

Age	Number	Pensions	Age	Number	Pensions
10	1	\$300	64	1	\$300
37	1 1	300	65	1	300
41	1 2	600	67	I	300
42	1 1	300			
44	1	300	Total Children	I	\$300
49	1	300	Total Widows	10	3,000
55	I	300	Total Parents	I	300
56	ı	300	Grand Total	12	\$3,600

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets and shows the complete financial condition of the fund as of that date:

TABLE 87—A VALUATION OF ASSETS AND LIABILITIES OF OF JUNE

Liabilities	
Item	Present Value of Payments to be Made
Pensions to 93 Pensioners now on the pension roll of the fund as follows:	
Service Pensioners: 71 Men on annual pensions aggregating \$68,180 2 Women on annual pensions aggregating 1,350 Disability Pensioners:	\$ 824,604 17,278
7 Men on annual pensions aggregating 4,730 1 Woman on annual pension aggregating 360 Widow Pensioners:	47,826 4,150
10 Widows on annual pensions aggregating 3,000 Children Pensioners:	38,303
t Child on annual pension aggregating 300 Dependent Parent Pensioners:	2,036
r Parent on annual pension aggregating 300	2,681
Total Pensions Entered Upon	\$936,878
Pensions to such Employees as will retire from the present active force of 1,262 members: Service Pensions:	
Men	\$1,417,850 370,997
In Actual Performance of Duty Any Cause after 20 years' service	65,307 38,042
In Actual Performance of Duty	23,318 9,366
Total Prospective Pensions to Employees	\$1,924,880
Pensions to Dependents of such employees of the present active force as will die in service: Widows' Pensions:	
Widows of employees who will die in Performance of Duty Children's Pensions:	\$23,946
Children of employees who will die in Performance of Duty Dependent Parents' Pensions:	1,566
Parents of employees who will die in Performance of Duty	4,410
Total Prospective Pensions to Dependents of Employees in Service	\$29,922
Total Pensions not Entered Upon	\$1,954,802
Grand Total	\$2,891,680

and liabilities of the Health Department Pension Fund as of June 30, 1914,

THE HEALTH DEPARTMENT PENSION FUND—VALUED AS 30, 1914

Assets	
Item	Present Value of Payments to be Received
Funds in hand creditable to: Men	\$248,819 81,228 86,222 28,942
Women *Deficiency creditable to: Men	1,834,852 611,617
•	
<u>,</u>	
Grand Total	\$2,891,680

Note—There is no definite bases for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$450,700.

The following table shows the estimated amount of appropriation required to continue the pensions of present pensioners until death or revocation of pensions. This table does not take into account the interest factor, as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll-that is, present pensioners.

TABLE 88—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

ns Pensions to Dependent Total	\$2 \$11,319	700'6 I :	8,594	7,395	6,308	5,327	4,455	3,688	3,017	2,441	156'1	I,531	I,202	926	703	525	387	283	203	: I45	8 -:-	89	+5		SI ::-	<u> </u>	* :: :: ::	:	—		70 53,634 \$1,444,30I
Pensions Pensions to to Widows Children	\$677	621 .	567	\$16	468	422	379	338	•	263	230	_	_		125	. Jos	. 87	_	_	_	_	27	. 20	17	∞	·	۵.		-	누	€02,429 ₹2,370
Service Pensions	\$10,071	8,779	7,587	6,497	5,511	4,625	3,841	3,154	2,558		_	-			541	393	28I	197	135	92	29	38	23	13	9	~	-	:	:		\$1,297,851
Disability Pensions	\$569	503	440			280	235	961	_		103						61		o i	7	4			H	_	:	:	:	:		Total \$78,017
*Date	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1961	1968	1969	1970	161	1972	1973	. 1	Total.
Year After Valuation	31	32	33	34	35	36	37	38	30	9	41	42	43	4	45	9	47	84	5	20	21	25	53	54	55	20	57	28	20		
Total	\$77,202	75,287	73,327	71,319	69,262	62,159	65,007	62,807	60,275	57,999	22,690	53,354	50,095	48,625	46,253	43,880	41,524	39,193	36,871	34,588	32,339	30,129	27,965	25,847	23,783	21,774	19,843	17,964	16,170	14,459	12,839
Pensions to Dependent Parents	\$293	280	267	254	240	227	213	661	185	172	159	146	133	121	100	46	87	92	Ž9	58	20	42	36	30	24	8	15	12	0	•	4
Pensions to Children	\$299	298	297	297	306	295	295	293	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Pensions to Widows	\$2,966	2,891	2,816	2,741	3,666	2,590	2,514	2,437	2,360	2,282	2,204	2,126	2,047	1,968	1,890	1,811	1,733	1,655	1,577	1,500					1,130	1,060	992	925	859	196	735
Service Pensions	\$68,694	61,119	65,485	63,790	62,036	60,226	58,358	56,437	54,467	52,452	50,397	48,308	46,192	44,059	41,917	39,771	37,635	35,511	33,408	31,331	29,282	27,268	25,292	23,358	21,472	19,639	17,862	16,148	14,507	12,942	11,460
Disability Pensions	\$4,950	4,699	4,462	4,237	4,024	3,821	3,627	3,441	3,263	3,093	2,930	2,774	2,623	2,477	2,337	2,201	2,069	1,951	1,819	1,699	1,583	1,470	1,362	1,257	1,157	1,055	974	879	795	715	040
*Date	1914	1915	9161	1917	1918	6161	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
Year After Valuation	0	-	۲۹	m	*	'n	9		••	0	9	=	12	13	4	15	91	17	82	10	20	21	22	23	7	25	98	23	700	20	9

"Date-Year beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Health Department, expressed as a percentage of the employee's salary.

FOR TABLE 89—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES NECESSARY TO PAY THE VARIOUS PENSION BENEFITS OF THE HEALTH DEPARTMENT PENSION FUND-Men

AGE AT ENTRANCE 20 4.39 21 4.59 22 23 4.59 24 5.07 25 5.07 26 5.89 28 6.18	Total		PENSION TO EMPLOYEES	113			-	
4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Total		1	DISABILITY PENSION	1		Pension to	Pension to
4 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6		Service Pension	Total	In Performance of Duty	Not in Performance	to Widows	Children	Dependent
	(1)+(2)+(3)	(I)	(2)+(3)	(2)	or Duty (3)	(*)	(\$)	. (9)
	4.22	3.73	.49	.42	.07	41.	10.	.02
	4.39	3.88	.51	44.	.07	.17	10.	.00
	4.58	4.04	, S.	94.	%	. 20	ō.	.03
	4.78	4.22	. 26	.48	%	7 6.	.00	.03
	ج 8	4.41	.59	os.	8,	.27	.00	<u>\$</u>
	5.23	9.4	.63	.53	o.	.31	.03	7 0.
	5.40	8.4	99.	.50	or.	.35	.03	So.
	5.71	5.01	٠,70	59	II.	.39	8	so.
	\$.95	5.21	47.	.62	. 13	4	5	so.
	.°°	5.43	82.	So.	.13	64.	9.	ė. Š
	0.44	S.61	89.	6 9.	7 1.		7	ġ,
	80.0	5.81	.87	.72	.15	Š.	5	8,
	0.03	8`	.92	.75	71.	0.	\$	8,
	7.13	o. 10	.97	6,7	21.	٥. د	So.	8.
	7.34	0.33	10.1	.82	61.	.07	So.	8
-	7.54	6.40	I.05	S.	8.	89.	٥.	8
	7.73	6.64	60.1	88.	12.	6 9.	So.	8.
	2.8	6.79	11.1	8.	12.	89.	٠. ده	%
	8 .03	16.9	1.12	.6	8.	89.	\$.07
	8.18	7.04	1.14	. 9	8.	99.	\$.07
	8.27	7.14	1.13	ş	61.	59.	ġ.	.

TABLE 90—RATES OF CONTRIBUTION EXPRESSED AS PER-CENTAGES OF SALARIES NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE HEALTH DEPART-MENT PENSION FUND—Women

			PENSION	TO EMPLOYE	ts		
AGB				DISA	BILITY PENS	iion	Pension to
AT ENTRANCE	Total	Total	Service Pension	Total	In Per- formance of Duty	Not in Perform- ance of Duty	Dependent Parents
		(1)+(2)+(3)	(1)	(2)+(3)	(2)	(3)	(6)
20	4.25	4.23	3.74	.49	.42	.07	.02
21	4 - 43	4.40	3.89	.51	-44	.07	.03
22	4.62	4.59	4.05	-54	.46	.08	.03
23	4.82	4.78	4.22	. 56	.48	.08	.04
24	5.02	4.98	4 - 39	.59	.50	.09	.04
25	5.24	5.20	4.58	.62	-53	.09	.04
26	5 · 47	5.43	4 - 77	.66	.55	.11	.04
27	5.71	5.66	4.97	.69	.58	.II	.05
28	5.95	5.90	5.17	.73	.61	. I 2	.05
29	6.18	6.13	5.36	.77	.64	. 13	.05
30	6.42	6.37	5 · 55	.82	.68	.14	.05
31	6.66	6.60	5 · 74	.86	.71	.15	.06
32	6.89	6.83	5.92	.91	.74	.17	.06
33	7.10	7.04	6.09	.95	.77	. 18	.06
34	7.31	7 - 25	6.25	1.00	.81	.19	.06
35	7.5I	7.45	6.41	1.04	.84	. 20	.06
36	7.70	7.64	6.56	1.08	.87	.21	.06
37 38	7.87 8.02	7.81	6.71	1.10	.89	. 21	.06
39	8.16	7.95 8.00	6. 83 6. 9 7	1.12	.91	.31	.07
40	8.20	8.22	7.IO	1.12	.92	.20	.07
~	0.29	0.22	7.10	1.13	-93	.19	.07

COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the College of the City of New York Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

Upon application after 20 years' service as supervising officer or teacher in the college, a pension of not less than one-half final salary, with a limitation of a maximum amount of \$3,000 for professors.* If member has not had 20 years' service in the college it is sufficient if he have 10 years' service in the college and 20 years' outside service in educational institutions in the United States.

The average allowance has been about 60 per cent of final salary.

Contributions

BY EMPLOYEE

No contribution.

By CITY

Indirect contributions:

Miscellaneous revenues, such as 1% of excise moneys as needed to cover maturing pensions.

Direct contributions:

None provided.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners.

BASIC DATA AND THEIR DEVELOPMENT

The schedules for employees were divided into two classes; one including the supervising and teaching staff of the college who are covered by the College of the City of New York Retirement Fund, and the other

^{*}The president of the college is entitled to an additional \$1000 annuity and the vice-president to an additional \$500 annuity on their respective retirements.

including the clerks, mechanics and laborers who are covered by the City of New York Employees' Retirement Fund. The schedules in the first class were used in connection with the valuation of the college fund, while the schedules in the second class were used in connection with the general valuation of the latter fund.

The general methods previously outlined were employed in developing the data to show unadjusted rates and in graduating the unadjusted rates. The extent of the experience is shown in the following tables:

TABLE 91—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

College of the City of New York Retirement Fund

umber Exposed to Risk		 	 			 	1,38
otal Number of Separations		 	 			 	8
Total Withdrawals	.	 	 			 	8
Resignations	<i></i> .	 	 			 	18
Dismissals	• • • • • • • • •	 	 			 	١.
Total Deaths		 	 			 	
Total Separations by Dis	ahility						i .
Total Service Retirement	a	 	 	• • • •	• • •	 	'

TABLE 92—SUMMARY OF EXPOSURE—SALARY

College of The City of New York Retirement Fund

Clase	Number of Annual Salaries	Total Payroli
Active Members		\$2,073,750 12,100
Total	1,011	\$2,085,850

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, a diagram is given on page 170 showing the rates plotted on cross section paper.

TABLE 93—RATES OF SEPARATION FROM ACTIVE SERVICE

College of the City of New York Retirement Fund

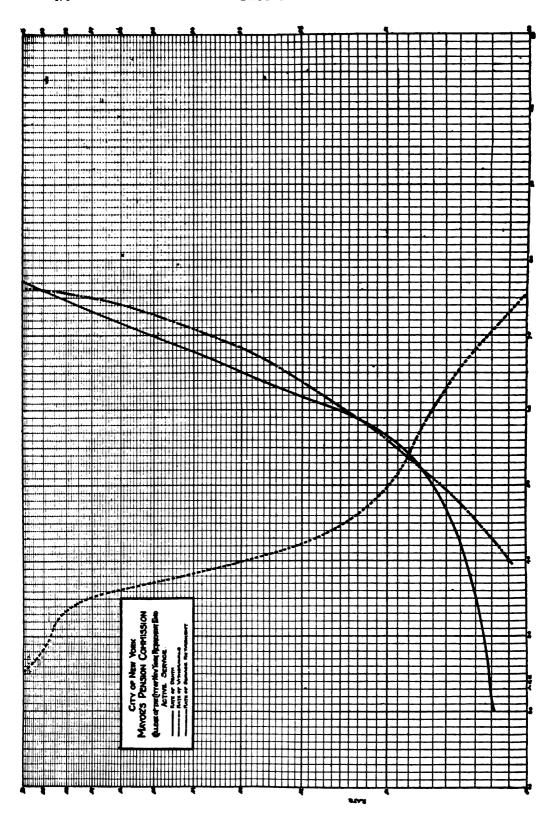
Age	Rate of With-drawal w qz	Rate of Death $dq_z^{(a)}$	Rate of Service Retirement ${}^{o}_{r}q_{x}^{(a)}$	Age	Rate of With-drawal $q_z^{(a)}$	Rate of Death $q_z^{(a)}$	Rate of Service Retirement
20	.1240	.0010		51	.0004	.0066	.0062
21	.1220	.0020	l	52	.0088	.0070	.0060
22	.1189	.0020		53	.0085	.0075	.0076
23	.1140	.0021		54	.0082	.0081	.0083
24	. 1080	.0021		55	.0077	.0088	.0092
25	. 1024	.0022		56	.0075	.0097	.0101
26	.0975	.0023		57	.0071	.0106	.0111
27	.0937	.0023		58	.0068	.0119	.0122
28	.0908	.0024	1	59	.0065	.0135	.0134
29	.0888	.0025		60	.0063	.0155	.0147
30	.0876	.0026	• • • •	61	.0057	.0181	.0161
31	. 0863	.0026		62	.0054	.0212	.0176
32	.0842	.0027	•••	63	.0050	.0242	.0191
33	.0818	.0028	• • • •	64	.0047	.0272	.0209
34	.0780	.0029		65	.0044	.0303	.0227
35	.0723	.0030	• • • •	66	.0039	.0336	.0247
36	.0628	.0032	• • • •	67	.0036	.0372	.0268
37	.0528	.0033	• • • •	68	.0033	.0412	.0297
38	.0435	.0034	• • • •	69	.0027	.0456	.0328
39	.0358	.0036	• • • •	70	.0024	.0502	.0363
40	.0294	.0037	.0010	71	.0019	.0558	.0408
41	.0248	.0039	.0013	72	.0016	.0620	.0458
42	.0213	.0040	.0017	73	.0013	.0690	.0521
43	.0184	.0042	.0021	74 75	.0007	.0762	.0607
44 45	.0164	.0044	.0024	75	.0003	.0838	.0724
45 46	.0147	.0046	.0028	77	• • • • • • • • • • • • • • • • • • • •	.0913	.0936
40 47	.0135	.0049	.0033	78	• • • •	.0998	.1350
47 48	.0122	.0052	.0038	79	• • • • • • • • • • • • • • • • • • • •	.1188	. 2400
48 49	.0112	.0055	.0043	80	• • • • • • • • • • • • • • • • • • • •	.1188	.4900
50	.0106	.0058	.0049	81	1		.7440
30	.0100	.0001	.0055	91	• • • • • • • • • • • • • • • • • • • •	. 1400	.3000

RATES OF RESIGNATION AND DISMISSAL

Practically no dismissals occur in the experience for the College of the City of New York, therefore but one rate of withdrawal was prepared. This rate, which is comparable with the total rates of withdrawal of the other services, is exceeded only by the rates for the Health Department and for the clerks and the laborers under the City of New York Employees' Retirement Fund. In the earlier ages the rates rank even higher than the rates for some of the classes mentioned, but after about age 35 it falls below these rates.

Although this high rate of separation from the service may be explained to some extent by the fact that no provision is made for disability retirement in the earlier ages, probably the most important cause of separation is the nature of the profession itself. Evidently many young men enter the service of the College of the City of New York and remain in it for a short time, and then leave to take teaching positions in other colleges or to enter upon some other business or professional career.

Although no outside rates were at hand for comparison the Commission was in a position to make some general tests of the rate by the use of statistics covering other colleges, which tended to corroborate the rate found for this service.



RATE OF DEATH

The death rate of the City College is as a whole the lowest in the city services,—the next higher rate being that for men school teachers in the Teachers' Retirement Fund. The rates for the three teaching groups,—namely, men and women in the elementary and high schools and members of the City College, are lower than those for any other of the city services. The explanation doubtless is that the teachers, a group well equipped to know and apply the general rules of healthful living, are engaged in a healthful occupation, granting long vacations and paying salaries that, as compared with those in other branches of the city service, are high, and that in consequence as a class they are better able to maintain themselves in good health than are the other employees of the city service.

In the earlier ages the mortality rate for the teachers in City College is slightly lower than that for the general men school teachers, but after about age 40 it rises somewhat above the latter rate. In general the death rate lies between the rate for the men teachers of New York City and a rate developed from the mortality experience of the English and Scottish men teachers participating in the "Elementary School Teachers' Deferred Annuity Fund."

RATE OF DISABILITY

As no pension is granted because of disability no cases of disability were reported and no rate developed.

RATE OF SERVICE RETIREMENT

The rate of service retirement in the College of the City of New York is one of the lowest rates found in the city services. In fact the only lower rates are those for laborers and for street cleaners. Possibly the reason why the rates for these two classes are lower is that few persons remain in the latter services long enough to become eligible for retirement. In the City College the low retirement rate is probably explainable not from the fact that the employees are ineligible for retirement, but from the fact that they do not care to retire. The salaries in this service apparently increase more rapidly than in any other service and the member probably prefers to retain his position rather than to go on the retirement roll.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

As the actual experience was insufficient to afford a reliable basis for a rate of mortality McClintock's Annuitants' Mortality Table for men was used. This table has been adopted by the Insurance Department of New York as the standard for valuing the annuities sold by the insurance companies of the state. The rates of mortality from that table are not reproduced here, but they are shown in the discussion of rates for pensioners of the Supreme Court, First Department, pension fund, page 284.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following active service table is based on the rates given on page 169; the mortality table for pensioners, which was used, is Table 155, shown on page 287 of the discussion of the pension fund of the Supreme Court, First Department.

TABLE 94—ACTIVE SERVICE TABLE AND SALARY SCALE

College of The City of New York Retirement Fund

71 		With-			-	-		_				-	
		drawals (a) w_x	Deaths d_x	Retire- ments o (a)	Total Decrement	Salary Scale	Age	Living last	With-drawals (c)	Deaths (a) d's	Retirements • (s)	Total Decrement	Salary Scale 52
l s	000'000'1	124,000	1,000	:	125,900	85	51	115,214	1,083	755	714	2,552	2,750
	74,100	106,640	1,713	:	108,353	578	52	112,662	992	200	777	2,559	2,780
7	765,747	01,047	1,539	:	92,586	670	53	110,103	936	828	837	2,601	2,830
· 6	673,161	76,740	1,400	:	78,140	815	54	107,502	882	874	892	2,648	2,870
- -	120,595	64,262	1,262	:	65,524	066	55	104,854	807	925	965	2,697	2,905
'n	529,497	54,220	1,160	:	55,380	011,1	20	102,157	992	988	1,032	3,786	2,940
4	74,117	46,226	1,067	:	47,293	1,208	57	99,371	206	1,056	1,103	2,865	2,975
<u>4</u>	26,824	39,993	986	:	40,04	1,295	28	96,506	929	1,150	1,177	2,983	3,010
₹ -	85,845	35,035	922	:	35,957	1,379	20	93,523	809	1,263	1,253	3,124	3,040
<u>~</u>	349,888	31,070	898	:	31,938	1,457	8	90,399	569	1,405	1,329	3,303	3,070
<u></u>	17,950	27,852	811	:	28,663	1,530	19	87,096	497	1,572	1,402	3,471	3,090
~	289,287	24,965	764	:	25,729	1,610	62	83,625	45r	1,769	1,472	3,692	3,130
~	263,558	22,192	717	:	22,909	1,680	S	79,933	8	1,934	1,527	3,861	3,150
7	240,649	19,685	189	:	20,366	1,752	2	76,072	358	5,069	1,590	4,017	3,170
~	20,283	17,182	949	:	17,828	1,822	65	72,055	317	2,183	1,636	4,136	3,195
ĕ	202,455	14,638	615	:	15,253	1,889	8	60,719	265	2,282	1,678	4,225	3,230
~ _	87,202	11,756	592	:	12,348	1,958	29	63,694	229	2,370	1,707	4,306	3,245
H	74,854	9,232	574	:	908,6	2,020	80	59,388	961	2,444	1,764	4,404	3,270
ĭ	165,048	7,180	261	:	7,741	2,080	69	54,984	148	2,507	1,804	4,459	3,280
ř.	157,307	5,632	558	:	6,190	2,140	2	50,525	121	2,537	1,834	4,492	3,300
H'	51,117	4,443	558	151	5,152	2,200	71	46,033	88	2,566	1,878	4,532	3,320
ř	45,965	3,620	563	061	4,373	2,260	73	41,501	%	2,573	1,901	4,540	3,340
ř	141,592	3,016	269	241	3,826	2,310	73	36,961	48	2,550	1,926	4,524	3,355
H'	137,766	2,535	580	289	3,404	2,365	74	32,437	23	2,470	1,969	4,462	3,370
H'	134,362	2,204	594	322	3,120	2,410	75	27,975	•	2,343	2,026	4,377	3,380
H	31,242	1,929	609	368	3,906	2,460	9/	23,598	:	2,154	2,209	4,363	3,395
ř	128,336	1,733	628	423	2,784	2,510	77	19,235	:	1,920	2,596	4,516	3,410
H	125,552	1,532	646	477	2,655	2,560	78	14,719	:	1,604	3,533	5,137	3,430
_	22,897	1,376	671	529	2,576	2,605	2	9,582	:	1,139	4,695	5,834	3,440
H	120,321	1,275	69	200	2,559	2,655	08	3,748	:	483	2,788	3,271	3,455
H	117,762	1,177	723	648	2,548	2,705	8	477	:	67	410	477	2.460

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

: . :: : :

The present value of the benefit was developed from the preceding service and mortality table. The following table shows the present value of total salary to be earned during active service on a basis of entrance salary of \$1,000, and the present value of a pension of final salary in terms of an entrance salary of \$1,000 upon event of the single condition upon which pension is payable, as given in the enumeration of benefits and contributions.

TABLE 95—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS AND THE PRESENT VALUE OF THE PENSION BENEFIT PAYABLE TO THESE MEMBERS BASED ON AN ENTRANCE SALARY OF \$1,000

College of The City of New York Retirement Fund

Age at Entrance	Total Future Salary	Pension to Members Upon Service Retirement	Age at Entrance	Total Future Salary	Pension to Members Upon Service Retirement
20	\$18,433	\$313	35	\$16,171	\$675
25	14,008	322	40	16,985	848
30	14,445	462			

The expectations of life and the present value of a pension of one to pensioners are of course the same as those shown for pensioners of the Supreme Court, First Department, which are presented on page 289.

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number and salaries of employees, by age and length of service, and the number and pensions of pensioners by age on the roll as of June 30, 1914:

TABLE 96—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

College of the City of New York Retirement Fund

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above
20	ı	\$900	218	\$484,100	48	4	\$13,250	40	\$135,550
21	١ ١		217	483,200	49	2	4,850	36	122,300
22	3	2,300	217	483,200	50	3	9,750	34	117,450
23	3 6	4,750	214	480,900	51	4	13,750	31	107,700
24	I	1,100	208	476,150	52	2	6,600	27	93,950
25	2	2,200	207	475,050	53	2	4,450	25	87,350
26	2	1,600	205	472,850	54	2	5,500	23	82,900
27	5	5,550	203	471,250	55			21	77,400
28	5 8 8	11,700	198	465,700	56	I	3,750	21	77,400
29	8	11,150	190	454,000	57			20	73,650
30	9	14,900	182	442,850	58			20	73,650
31	10	17,800	173	427,950	59	I	4,000	20	73,650
32	8	15,950	163	410,150	60	3	6,700	19	69,650
33		13,600	I 54	394,200	61	I	5,000	16	62,950
34	7 6	14,300	146	380,600	62	I	1,700	15	57,950
35		12,100	139	366,300	63	I	2,750	14	56,250
36	11	24,000	133	354,200	64	1	1,900	13	53,500
37	7	16,500	122	330,200	65	2	8,750	12	51,600
38	II	22,350	115	313,700	66			10	42,850
39	7	20,000	104	291,350	67	2	8,500	10	42,850
40	3	5,500	97	271,350	68	I	2,750	8	34,350
41	7	19,800	94	265,850	69	2	6,200	7	31,600
42	13 8	27,000	87	246,050	70			5	25,400
43	8	19,300	74	219,050	71	1	, 2,400	5 5	25,400
44	6	19,900	66	199,750	72	I	5,000	4	23,000
45	8	17,850	60	179,850	73		• • •	3	18,000
46	8	18,100	52	162,000	74	2	10,500	3	18,000
47	4	8,350	44	143,900	75	I	7,500	I	7,500

TABLE 97—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDI-TIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDI-CATED SERVICE OR MORE

College of the City of New York Retirement Fund

Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	2	\$1,500	218	\$484,100	16	1	\$2,200	46	\$150,100
1	10	9,750	216	482,600	17	4	11,750	45	156,900
2	3	3,600	206	472,850	18	5	16,750	41	145,150
3	10	10,550	203	469,250	19	5 3 1	8,200	36	128,400
4	6	10,050	193	458,700	20		2,750	33	120,200
5 6	12	17,700	187	448,650	21	3 I	8,950	32	117,450
6	6	10,300	175	430,950	22		2,750	29	108,500
7	24	42,900	169	420,650	23	3 3 1	8,500	28	105,750
8	19	35,100	145	377.750	24	3	9,650	25	97,250
9	16	31,600	126	342,650	25		4,000	22	87,600
10	17	38,050	110	311,050	26	I	3,500	21	83,600
11	14	32,200	93	273,000	27	2	7,000	20	80,100
12	11	24,850	79	240,800	28	4	12,350	18	73,100
13	13	37,100	68	215,950	29	. 2	5,500	14	60,750
14 15	3 6	6,400 13,350	55 52	178,850 172,450	30 & over	} 12	55,250	12	55,250

TABLE 98—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE

College of the City of New York Retirement Fund

Number	Pensions	Age	Number	Pensions
I	\$1,000	78		
I	700	79	• • •	
		80		l
		81	I	\$1,630
1	1,000	11		
• • •		Total	4	\$4,330
	I I 	I \$1,000 I 700 I 1,000	I \$1,000 78 I 700 79 80 81 I 1,000	I \$1,000 78 700 79 80 I 1,000 I 1,000

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets of June 30, 1914, and shows the complete financial condition of the fund

TABLE 99—A VALUATION OF ASSETS AND LIABILITIES OF THE FUND—VALUED AS

Liabilities	
Item	Present Value of Payments to be Made
Pensions to 4 Service Pensioners now on the pension roll of the fund on annual pensions aggregating \$4,330	\$24,152
Total Pensions Entered Upon	\$24,152
Pensions to such Employees as will retire from the present active force of 218 members	\$480,067
Total Pensions Not Entered Upon	\$480,067
Grand Total	\$504,219

and liabilities of the College of the City of New York Retirement Fund as as of that date:

COLLEGE OF THE CITY OF NEW YORK RETIREMENT OF JUNE 30, 1914

Assets	
Item	Present Value of Payments to be Received
Funds in hand	\$5,054 499,165
Grand Total	\$504,219

^{*}Nore—The law provides that pensions may be paid out of the excise moneys, but, as no definite limit is placed on the amount of the excise moneys which may be used for this purpose, no estimate of the return from this source has been made.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death. This table is based on the mortality table of pensioners and does not take into account the interest factor, which does not affect the appropriation if the amounts to pay pensions are appropriated as the pensions become payable.

TABLE 100—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Year After Valuation	*Date	Service Pensions	Year After Valuation	*Date	Service Pension
0	1914	\$4,103	14	1928	\$384
1	1915	3,690	15	1929	294
2	1916	3,294	16	1930	222
3	1917	2,915	17	1931	163
4	1918	2,558	18	1932	118
5	1919	2,225	19	1933	83
6	1920	1,916	20	1934	56
7	1921	1,634	21	1935	37
8	1922	1,379	22	1936	24
9	1923	1,150	23	1937	15
10	1924	949	24	1938	9
11	1925	773	25	1939	5
12	1926	621	26	1940	3
13	1927	492	27	1941	1
			Tota		\$29,113

College of the City of New York Retirement Fund

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the College of the City of New York, expressed as a percentage of the employee's salary.

TABLE 101—RATES OF CONTRIBUTION EXPRESSED AS PER-CENTAGES OF SALARIES NECESSARY TO PAY FOR THE PENSION BENEFIT OF THE COLLEGE OF THE CITY OF NEW YORK RETIREMENT FUND

Age at	Total	Age at	Total	Age at	Total	Age at	Total
Entrance	Pension	Entrance	Pension	Entrance	Pension	Entrance	Pension
20 21 22 23 24 25	1.70 1.79 1.90 2.01 2.15 2.30	26 27 28 29 30	2.46 2.63 2.82 3.00 3.20	31 32 33 34 35	3.40 3.59 3.79 4.00 4.17	36 37 38 39 40	4.36 4.53 4.69 4.85 4.99

^{*}Date year beginning July 1st.

CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the City of New York Employees' Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

Upon disability after 30 years' service, a pension of not more than one-half of average of last three years' salary.

If employees are veterans of Civil War, a service of 20 years is sufficient.

Because of lack of sufficient experience the average allowance used was 50 per cent. of average of last three years' salary.

Contributions

BY EMPLOYEES

No contributions.

By CITY

Indirect contributions:

Proportion of excise taxes as required to pay maturing pensions.

Direct contributions:

None provided.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death

Rate of separation through disability

Rate of change of salary

Rate of death of pensioners.

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The City of New York Employees' Retirement Fund covers any officer, clerk or other employee in the service of the City of New York who is not entitled to share, or who has not elected to share, in any of the departmental funds. All schedules not to be used under any other fund were therefore assembled for use in this valuation. The following table gives the departments represented by these schedules. The only schedules not included in the valuation are those representing hospital helpers and pupil nurses who had had less than a year of service and whose salary was less than \$360. The probability of these employees fulfilling the requirement of thirty years of service prior to retirement with pension is slight

and the effect on the total liability, made by excluding them from the valuation, is hardly appreciable.

DEPARTMENTS REPRESENTED BY EMPLOYEES COVERED BY NEW YORK CITY EMPLOYEES' RETIREMENT FUND

Name of Department	Name of Department
Accounts, Commissioner of	Fire
Ambulance Service, Board of	#Health
Armory Board	*Hunter College
Art Commission	Inebriety, Board of
Assessors, Board of	Jurors, Commission of
*Bellevue and Allied Hospitals	Law
Borough Presidents	Licenses
Bridges	Mayor's Office
City Chamberlain	Municipal Civil Service Commission
City Record, Board of	Parks
College of the City of New York	Parole, Board of
Coroners	Plumbers, Examining Board of
Correction	Police
*County Clerks	Public Administrator
Courts—City	Public Charities
Courts—County	Public Recreation Commission
*Court of General Sessions	Public Service Commission
Courts of the City of New York—Municipal	Records, Commissioner of
Court of Special Sessions	Register's Office
*Court—Supreme	School—Brooklyn District Training
Courts—Surrogates'	Sheriff's Office
*District Attorney	Sinking Fund, Commissioner of
Docks and Ferries	*Street Cleaning
Education	Taxes and Assessments
*Elections, Board of	Tenement House
Estimate and Apportionment, Board of	Water Supply, Board of
Examiners, Board of	Water Supply, Gas and Electricity
Finance	Weights and Measures

^{*} In checking the number of schedules in this department, there was some doubt as to the actual number of withdrawals, in the period of experience. It seemed advisable to omit these schedules from the actual experience tables. These schedules were, however, included in the valuation.

Schedules representing the exempt, the elected and the appointed employees in the departments shown above were not used in developing rates, since the positions of these employees differ somewhat from those of the general employees who form the main basis of the experience. These classes were all included in the valuation, but the amount of liability due to them was computed separately in order that the exact cost of including them in the pension system might be known.

Special methods of handling data

The employees included under this fund, as has been shown, represent approximately every department of the city service and, therefore, represent widely varying occupations and salaries. To include the data for all these employees in one experience tabulation and to derive basic rates from it did not seem advisable, since the rates could not have been regarded as measuring the contingencies to which each member of the fund is subject. It was finally decided, therefore, for reasons given on page 19, to distribute the schedules into three broad divisions by occupation, defined as follows:

1. Clerks, administrative officers and technical employees. This class includes about 45% of the total number of employees considered under the

fund and represents over three hundred different administrative, clerical and technical positions. All employees included under this class are hereafter referred to as clerks.

- 2. Laborers. This class includes employees engaged in what is regarded as unskilled labor and embraces approximately 37% of the total number of employees considered. About 113 specific occupations are represented according to the civil service list.
- 3. Mechanics. This class includes about 18% of the total number of employees covered by this fund and embraces about 110 occupations.

Originally it was planned to divide further the two classes, clerks and laborers, according to sex and to develop separate rates for men clerks and women clerks, for men laborers and women laborers. After the schedules were divided it was found, however, that the salaries received by women clerks formed only 10% of the total salaries of clerks and that the salaries of women laborers formed only 5% of the total salaries of laborers. A slight addition to or subtraction from the measure of liability to provide for the presence of women clerks and women laborers could therefore make only a slight difference in the total liability involved under their respective classes and a relatively small difference in the total liability involved under the fund. For this reason it was considered sufficiently exact to obtain the liability due to women clerks and to women laborers by the use of the rates for men clerks and men laborers, because in this way much labor could be saved in the graduation of rates.

Actual experience sheets were at first tabulated in the aggregate form for the three classes, men clerks, men laborers and mechanics, but these tabulations indicated for each division such high total rates of separation from active service that it became apparent that aggregate rates could not be satisfactorily employed in the construction of service tables. Tabulations of the experience were then made for each division in a select form in which the separations occurring in the first three years of service were tabulated by individual years and only those separations occurring after the third year were combined. The gross rate of separation was accordingly reduced approximately for clerks from about 33% in the first year of service to 6% after three completed years of service; for laborers from about 32% in the first year of service to 5% after three completed years of service.

The table on page 182 shows for the active service of each class the extent of the exposure used and the actual number of separations, classified by cause, occurring in the first three years of service and after three completed years of service.

Of the total separations occurring in the first year of service 85% were resignations and 12% dismissals among clerks; 67% were resignations and 28% dismissals among laborers, and 79% were resignations and 18% dismissals among mechanics. Of the separations occurring after three years of service had been completed the proportion found by resignations was reduced to 57% among clerks; to 34% among laborers, and to 49% among mechanics; the proportion found by dismissals was reduced to 12% among clerks; to 24% among laborers, and to 15% among mechanics. The num-

182 SECTION II

TABLE 102—SUMMARY OF EXPOSURE AND SEPARATIONS— ACTIVE SERVICE

City of New	York	Employees'	Retirement	Fund
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	Years	Exposed	v	VITHDRAWAL	.s		Service	Total
CLASS	of Service	to Risk	Resigna- tions	Dismissals	Total	Deaths	Retire- ments*	Separa- tions
Clerka	One Two Three Ultimate	8,698.5 5,493.5 4,649.5 30,083.5	601 309 1,059	341 72 49 228	2,765 673 358 1,287	75 52 42 529	 40	2,840 725 400 1,856
	Total One	0,041.5	4,393 2,041	690 842	5,083 2,883	698	40	3,024
Laborers	Two Three Ultimate	6,293.5 5,657. 41,162.5	522 283 873	247 130 626	769 413 1,499	100 115 1,021	39	869 528 2,559
	Total	62,154.5	3,719	1,845	5,564	1,377	39	6,980
Mechanics	One Two Three Ultimate	5,071. 3,271.5 2,964. 22,081.5	1,390 323 188 548	313 75 38 173	1,703 398 226 721	56 29 35 369	31 	1,759 427 261 1,121
	Total	33,388.0	2,449	599	3,048	489	31	3,568

These are Technically Disability Retirements but on account of Service Limitation, they were used as Service Retirements.

ber of separations by death do not show, however, a marked variation with the first few years of service. It was assumed, therefore, that the rates of resignation and dismissal only were primarily affected by years of service, and accordingly the select rates of resignation and dismissal were graduated directly from the data, while the select rate of death was obtained from the ultimate rate by the method previously described on page 20.

Certain adjustments in the rate were necessary because of the fact that the pension act was originally limited to the Department of Finance and was not amended to include all employees until 1911. The experience regarding retirement could therefore be used only as an indication of the general tendency of the rate and as a guide in the selection of a rate of retirement for adoption in the manner described in the discussion pertaining to the rate in question.

On the adoption of the rate of retirement the rates of resignation and of dismissal for each class were reduced on the theory that certain separations from service which had in the past necessarily taken place as resignations would in the future take place as retirements.

The laws controlling this fund do not provide for retirement on account of disability for employees with less than thirty years of service, and thus employees becoming disabled prior to completion of thirty years of service leave the service through resignation or dismissal. It is very probable, therefore, that many cases of resignation recorded in the experience were actually cases of disability. On this assumption it seemed advisable to introduce a rate of disability. A rate was therefore adopted and the rates of resignation and dismissal were further reduced to allow for it. For

purposes of the present valuation this rate is to be considered only as a part of the withdrawal rate, but it may be useful in approximating the cost in case the introduction of a provision by which a disability pension is granted without service limitation.

The experience regarding the rate of salary change was prepared and used in accordance with the general methods described in section I. The following table shows the extent of the experience available for use:

TABLE 103—SUMMARY OF EXPOSURE—SALARY

City of New York Employees' Retirement Fund

	Cr	BRKS	Lai	BORERS	Мвс	HANICS
CLASS	Number of Annual Salaries	Total Payroll	Number of Annual Salaries	Total Payroli	Number of Annual Salaries	Total Payroll
Active Members: Men Women Pensioned Members:	33,753 4,927°	\$46,695,770 4,746,000	42,466 2,554	\$33,651,610 1,125,330	23,824	\$35,928, 09 0
Men Women	104 8	206,260 4,500	133 5	125,300 4,500	107	177,260
Total	38,792	\$51,652,530	45,158	\$34,906,740	23,931	\$36,105,350

The experience in regard to pensions was so incomplete that no tabulations were made summarizing it.

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

Rates developed on a select basis are compared first with rates developed on the same basis and then with aggregate rates. In order to make comparison with aggregate rates the select and ultimate rates have been respectively multiplied into a standard service exposure, which has been subdivided by years of service, and the expected cases of separation obtained in this way have been contrasted with the cases obtained by use of the comparative aggregate rate and the same exposure. This method is explained in detail on pages 392 and 393.

The active service—clerks

The following table shows the rates that were used for clerks among the members of the City of New York Employees' Retirement Fund. As has been stated, these rates were based on the experience of men, but used for both men and women. To visualize the increases and decreases in these rates from age to age and to show their relative importance at various ages, diagrams showing the rates plotted on cross section paper are given on pages 188 to 190.

TABLE 104—RATES OF SEPARATION FROM ACTIVE SERVICE
City of New York Employees' Retirement Fund—Clerks

YC#				G.	RATES OF WITEDRAWAL	TWAT			
		RESIGNATION	NOLL			DrsM	DIENTSSAL		TOTAL ULTIMATE
	$r_{m{w}}q_{[x]}^{(a)}$	$req_{[x-1]+1}^{(a)}$	req(a)	r q(a)	d w Q (a)	4 w Q(x-1)+1	1 d g(a)	6 w q (a)	*D.
16	.0749	:	:	:	.0138	:	:	:	:
17	.0880	.0712	:	:	.0142	6600.	:	:	:
18	0101.	8080.	.0630	:	.0147	010.	6200.	:	:
19	.1120	.0875	.0677	.0597	.0151	1010.	9800.	7 900.	1990.
20	.1220	.0931	.0710	2090.	.0159	.0102	1800.	9900.	.0673
21	.1300	1760.	.0731	0190.	.0167	4 010.	.0083	2000.	.0677
77	.1370	0101.	.0749	8090	.0175	2010.	9800.	8900.	9290.
23	.1425	. 1038	.0758	0090	4810 .	6010.	8800.	6900	6990
24	.1473	.1058	1940.	1650.	.0195	2110.	0 600.	1,00.	2 990.
25	.1515	6901.	.0760	.0583	9020	9110.	.0002	.0072	.0655
56	.1548	.1072	.0755	.0574	.0217	6110.	* 600.	.0073	.0647
27	.1571	1701.	.0748	.0565	.0228	.0122	800°.	4/00.	.0639
78	. 1590	6901.	.0739	.0555	.0238	9210.	6600.	.0075	.0630
50	1605	. 1058	.0720	.0544	.0248	.0130	1010.	9200.	0000
30	0191	.1041	10/0.	.0532	.0258	.0133	.0103	.0078	0190.
31	6091	1001.	6290	. 0520	.0266	.0138	9010.	6200.	0650
32	.1602	2660.	.0652	.0507	.0274	.0140	.0108	8 80.	.0587
E (. 1590	9960.	.0028	.0494	.0282	.0144	6 010.	180°	5,50·
41	.1570	1860.	.0598	.0478	.0289	.0147	1110.	288	.0500
000	.1541	0000	0200	.0400	.0205	.0150	.0112	000	.0548
000	.1511	040	.0538	.0444	0500	.0152	2110.	200	0230
000	. 14/3	9900	500	250.	1050.	55.0	5110	S 8	
0 0	7.50	9,6	5550	48.0	550	0.5	4110	S S	2000
34	0001	2,40		9,50		25.5		200	0448
=		2000	0403	.0127	S :	910	1110	988 480	1170
42	:	3 :	.0381	0300	:	' :	0110.	.0083	.0383
43	:	:	:	.0272	:	:	:	.0082	.0354
\$:	:	:	.0249	:	:	:	0800	.0329
45	:	:	:	.0228	:	:	:	.0078	.0306
9	:	:	:	.020	:	:	:	.0075	.0284
74	:	:	:	.0193	:	:	:	1,00	7920.
80	:	:	:	7,10.	:	:	:	.0007	.0244
9	:	:	:	.0103	:	:	:	0003	.0226
00	:	:	:	.0150	:	:	:	.0050	.000
21	:	:	:	.0130	:	:	:	.0055	1010.
	:	:	:	.0124	:	:	:	- 889	.0174
255				.0112			-	.0045	.0157

TABLE 104—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued City of New York Employees' Retirement Fund-Clerks

				RAI	RATES OF WITEDRAWAL	ıj.			:
•		RESIGNA	SIGNATION			DISMISSAL	VI.		TOTAL ULTIMATE
YCE	r * q(a)	$r_{w}q_{(x-1)+1}^{(a)}$	r w q(a)	' • q (a)	4 w Q (a)	$^{a} w q_{(x-1)+1}^{(a)}$	$\overset{d}{\omega} \varphi_{[x-2]+2}^{(a)}$	d w $q_x^{(a)}$	*pa
25		:		.0102	:		:	.0041	.0143
22	:	:	:	.0002	:	:	:	.0037	6210.
26	:	:	:	.0083	:	:	:	.0033	9110.
21	:	:	:	.0075	:	:	:	.0029	.0104
88	:	:	:	2900.	:	:	:	.0026	.0003
20	:	:	:	.0059	:	:	:	.0022	1800.
8	:	:	:	.0052	:	:	:	.0020	2200.
61	:	:	:	.0042	:	:	:	7100.	6500.
62	:	:	:	.0038	:	:	:	.0014	.0052
ន	:	:	:	.0031	:	:	:	.0012	.0043
\$:	:	:	.0025	:	:	:	00100	.0035
65	:	:	:	6100.	:	:	:	8000	.0027
8	:	:	:	.0013	:	:	:	9000	6100·
29	:	:	:	8000.	:	:	:	0004	.0012
89	:	:	:	.0003	:	:	:	.0003	9000.
5	:	:	:	:	:	:	:	.000	.0003
2	:	:	:	:	:	:	:	:	:
7	:	:	:	:	:	:	:	:	:
72	:	:	:	:	:	:	:	:	:
23	:	:	:	:	:	:	:	:	:
7.	:	:	:	:	:	:	:	:	:
75	:	:	:	:	:	:	:	:	:
26	:	:	:	:	:	:	:	:	:
71	:	:	:	:	:	:	:	:	:
28	:	:	:	:	:	:	:	:	:
2	:	:	:	:	:	:	:	:	:
8	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:
82	:	:	:	:	:	:	:	:	:
8	:	:	-	•			-		

TABLE 104-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued

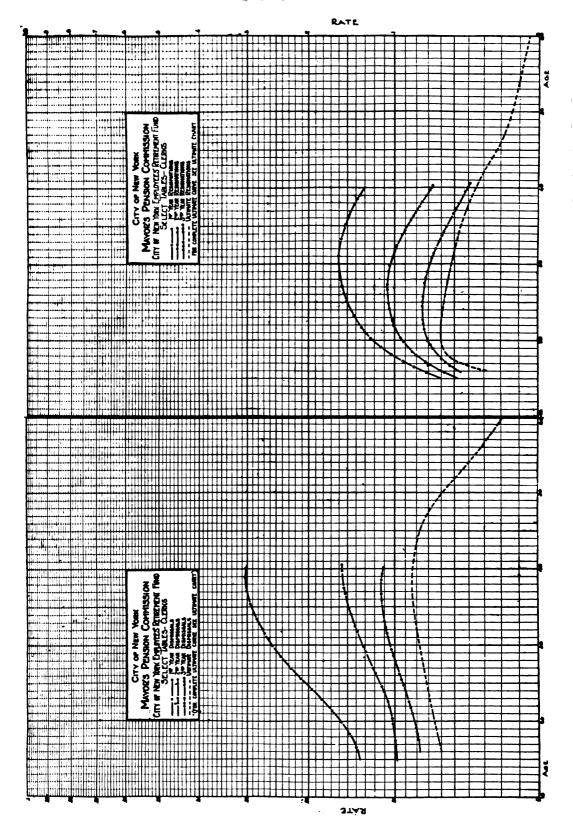
City of New York Employees' Retirement Fund-Clerks

						RATI	RATES OF DISABILITY		
		RATES OF	S OF DEATH			WITHOUT PENSION	PENSION		WITH PERSON
Y CR	d q(a)	4(0)	4 (a) q (z-2)+2	4 (0)	1rq(a)	(rq(a)	4.Q(a)	*b4,	•rq(a)
92	.0042				.000			:	:
11	7700	9700			000	1000			:
-	2700.	8700	0000	: :	000	1000	1000		:
2	2	9300			8			ě	
25		2000	•	• • • • • • • • • • • • • • • • • • • •	533.	3	3		:
- 2:	.0047	1500.	.0053	.0054		7 08.	1000	000	:
12	.0048	.0053	.0055	.8056	- -	5 00.	7000.	7 000.	:
	.0049	.0054	.0057	.0058	200	7000	7000	2000.	:
ឌ	.0050	9500.	980	900.	7000	7000	2000.	2000.	:
74	2500.	8500.	.0001	.0063	7000	8	, 000 000	5000	:
35	200	0000	2900	1900	2000	000	9000	9000	
2		900	296	9		8	9	9000	
-		300	3,8		3	38	38	8	:
	300	n ay	3	3	3 8	38		8 8	:
9 9	660	8 8	33	1 /30.	5	3 3	7	3 8	:
36	2000	100.	5/00.	720.	000	2000	2000	7000.	:
2:	7 000.	\$ 200.	6,00.	& 00.	8	.000	8	8	:
18	2000.	.0077	.0082	908	.000	800°	8	8 08.	:
32	0700.	1800.	9800.	.0087	.0007	808	6 8.	6 00.	:
2	.0073	9 800.	6800·	1600	8000	6000	0100	0100	:
*	.0076	8800.	.0003	.0005	8000.	0100	0100	0100	:
32	80°.	.000	2600.	8000.	6 00.	0100	1100	118	:
36	.0083	9600. 	IOIO.	.010	0100	.001	.001	.0012	:
37	.0087	.0100	.0105	9010.	1100	.0013	.0013	.0013	:
	.0003	9010	1110.	.0112	.0012	4100 .	.0015	0015	:
200	2600 .	1110.	9110.	7110.	.0013	S100.	9100.	9100.	:
\$.0103	6110.	.0122	.0123	.0015	7100.	8100.	8100.	:
7	:	.0123	0210·	.0130	:	0100·	6100.	.0030	:
-	:	:	.0136	.0138	:	:	1000	.0022	:
3	:	:	:	.0146	:	:	:	4200.	:
‡	:	:	:	.0155	:	:	:	9200.	:
+ 5	:	:	:	9910.	:	:	:	.0020	:
9	:	:	:	.0178	:	:	:	.0033	900.
47	.:	:	:	.0192	:	:	:	9600.	7100.
2	:	:	:	.0208	:	:	:	0040	.0020
\$:	:	:	.0228	:	:	:	.0045	.0030
S	:	:	:	.0255	:	:	:	8. 8.	1500.
51	:	:	:	.0271	:	:	:	9800.	7000
22	:	:	:	.0280	:	:	:	.000	.00
5			_	## C					

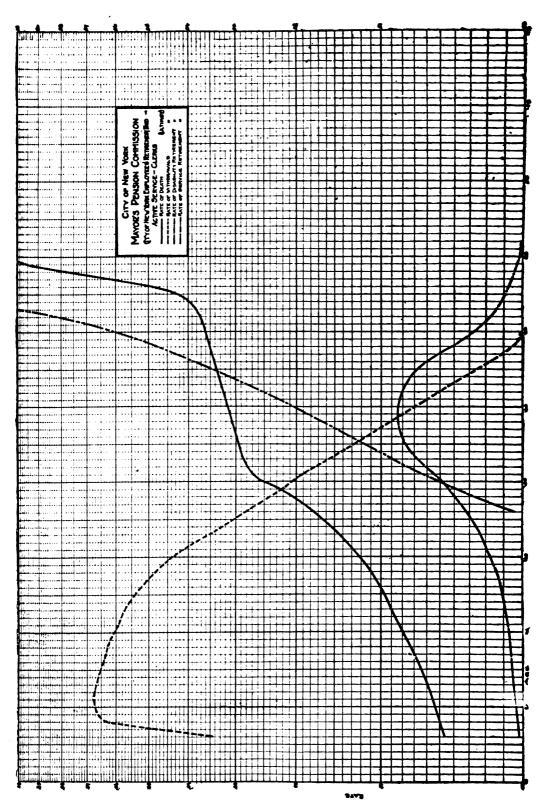
TABLE 104—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued

City of New York Employees' Retirement Fund-Clerks

			-		15	RATES OF DISABILITY	•	
	AAIES OF DEATH	DEATE			Withour	WITHOUT PRISION		WITH PRINGIN
$q_{[x]}^{(a)}$	4 (a) 4 (x-1)+1	^d g _{(s-21} +2	d q (a)	(rq(a)	4, Q(a)	fr g(a)	(*, Q'(a)	* pq(a)
:	:	:	.0292		:	:	100.	1010.
:	:	:	.0297	:	:	:	.0078	0110
:	:	:	.0301	:	:	:	1800.	.0132
:	:	:	.0305	:	:	:	.0083	.0149
:	:	:	.0308	:	:	:	4 800.	9910.
•	:	:	.0313	:	:	:	.0084	.0184
:	:	:	.0318	:	:	:	. 0084	.0207
:	:	:	.0322	:	:	:	.0083	.0230
:	:	:	.0327	:	:	:	1800	.0255
:	:	:	.0331	:	:	:	.0078	.0383
:	:	:	.0335	:	:	:	4/00.	.0314
:	:	:	.0339	:	:	:	6900	.0348
:	:	:	.0344	:	:	:	1900.	.0386
:	:	:	.0348	:	:	:	.0052	.0428
:	:	:	.0353	:	:	:	.0043	.0478
:	:	:	.0357	:	:	:	.0035	.0535
:	:	:	.0361	:	:	:	.0028	4090.
:	•	:	.0305	:	:	:	.0023	9690
:	:	:	.0371	:	:	:	8100.	.0825
:	:	:	.0381	:	:	:	.0015	. 1030
:	:	:	.0308	:	:	:	.0012	0041
:	:	:	.0430	:	:	:	0100	. 1850
:	:	:	.0408	:	:	:	8000	. 2380
:	:	:	.0025	:	:	:	9000	.3025
:	:	:	.0792	:	:	:	4000 .	.3775
:	:	:	.0972	:	:	:	.0003	.4575
:	:	:	.1170	•	:	:	.000	.\$450
:	:	:	.1330	:	:	:	1000	.6400
:	:	:	1500	:	:	:	:	.7300
:			2,5					



Charm.



The rates of resignation and dismissal among the clerks in the City of New York Employees' Retirement Fund vary markedly, as has been stated, with years of service when the service is less than three completed years. For the first year of service the rate of resignation is the second highest of the rates developed on the select basis; the highest being that applying to members of the Health Department Pension Fund.

The ultimate rate ranks first, but when the ultimate and select rates are considered together as an aggregate rate of resignation, it ranks second highest out of seven resignation rates which were developed, being lower than the rate for the Health Department and higher than that for mechanics.

The rate of dismissal for the first year of service is next to the lowest of such rates developed on the select basis; that for the Health Department being in this case the lowest.

The ultimate rate of dismissal is, however, fourth highest, being exceeded by the rates applicable to street cleaners, laborers and mechanics. If the select and the ultimate rates are considered together as an aggregate rate of dismissal for clerks it ranks fourth or as the central one of the seven rates prepared. It is lower than that for mechanics and higher than that for policemen.

If the two aggregate rates are combined as a total aggregate rate of withdrawal, this total rate will rank second out of the eleven total withdrawal rates prepared; being exceeded by that for the Health Department and immediately followed by that for laborers. This rate is generally higher than a similar rate obtained from the experience of the salaried and professional employees of the government insurance service of New South Wales, which apparently indicates that service in New South Wales is slightly more permanent than the New York City service.

RATE OF DEATH

The rate of death among clerks in the City of New York Employees' Retirement Fund is the second highest of the eleven rates of death which were prepared, being exceeded only by that among laborers. The fact that no retirement allowance is provided for disabled clerks with less than thirty years of service probably affects the rate of death by increasing the number of deaths in the active service. In the middle period of life the difference between a rate based upon active and disabled lives combined and one based upon active lives alone,—such as is obtained in some departments where all impaired lives have been removed through disability pension, would probably be most noticeable. It is in the middle period of life that the rate of death for clerks is comparatively high.

RATE OF DISABILITY WITHOUT PENSION

The rate of separation on account of disability among clerks of the City of New York Employees' Retirement Fund, as previously stated, has been derived on the assumption that a certain number of the withdrawals, recorded as resignations, actually occurred on account of disability. Roughly, 7% of the actual ultimate cases of withdrawal among

clerks were used as withdrawals on account of disability. The rate was made to follow the general trend of the corresponding rates for the Health Department Fund and for men in the Teachers' Retirement Fund, on the assumption that employees in these departments somewhat closely resemble the group of employees for whom this rate was being derived as regards the degree of exposure to disability.

The rate of disability employed is comparatively low; ranking about eighth out of ten rates derived and lying between the rate derived for the Supreme Court, First Department, Retirement Fund, which is higher, and the rate for the Health Department Fund, which is lower.

RATE OF SERVICE RETIREMENT

For clerks the rate of retirement on pension is technically a rate of disability, since the law allows pensions only to persons who have had thirty years of service and are disabled. As this retirement provision was evidently intended to relieve the service of the ill effects of superannuation, the rate has been considered for comparative purposes as if it were simply a rate of retirement without the disability provision. The experience of the years 1913 and 1914 was taken as indicative of the general tendency of the rate; the rate itself was developed in about the same form as that of rates of retirement in similar services. The rate developed for clerks as a whole up to age 65 ranks about ninth out of twelve rates prepared and lies between the rate for mechanics, which is higher, and the rate for members of the College of the City of New York, which is slightly lower.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the averaging salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

The active service—laborers

The following table shows the rates that were used for the laborers in the City of New York Employees' Retirement Fund. For reasons previously stated these rates were based on the experience for men but were used for both men and women. To visualize the increases and decreases in these rates from age to age, diagrams showing the rates plotted on cross section paper are given on pages 197 to 199.

TABLE 105-RATES OF SEPARATION FROM ACTIVE SERVICE

. Laborers
Fund
Retirement
Employees,
York
of New
City

				, Z	RATES OF WITHDRAWAL	VF.			
AGE		RESIGN	RESIGNATION			DISMISSAL	SSAL		TOTAL ULTIMATE
	r w q(a)	$r_{\boldsymbol{w}}q_{[x-1]+1}^{(a)}$	$r_{oldsymbol{v}}q_{[x-2]+2}^{(a)}$	req (a)	d w q (a)	d w q (a)	d w Q (a)	d w q (a)	
16	. 1040	:	:	:	.0546				
17	0011.	.0599	:	:	.0543	.0302		: :	: :
18	.1150	.0625	.0399	:	.0541	.0302	.0210	: :	: :
61	4611.	.0649	.0424	.0379	.0540	.0301	.0218	9210.	.0444
2	.1230	5990	.0449	.0396	.0538	.0301	.0217	.0175	1250.
22	. 1260	.0678	.0461	.0408	.0536	.0300	.0215	4/10.	.0582
77	.1289	6890.	.0474	.0416	.0533	.0299	.0213	4/10.	.0590
23.5	.1309	9690.	.0481	.0420	.0531	.0298	.0212	.0173	.0593
*	.1321	.0700	.0487	.0419	.0529	.0297	.0211	.0172	1650.
3 2	.1330	.0700	.0489	.0415	.0527	9620.	.0210	1/10.	.0586
9 5	.1339	.0700	.0487	.0400	.0523	.0294	.0200	0110	.0576
22	.1339	969o.	.0485	.0394	.0521	.0292	.0208	6910.	.0563
8 8	.1333	0600	.0474	0380	0150.	1620.	9020.	8910.	.0548
5.7	.1323	0800.	.0403	.0301	.0515	.0200	.0203	7910.	.0528
3 :	.1308	.0070	.0451	.0341	.0511	.0288	.0202	.0165	.0506
	. 1292	0000	.0440	.0322	.0500	.0287	.0200	.0164	.0486
7 6	.1274	.0050	.0422	.0302	.0504	.0285	0010	.0162	.0464
3 5	.1251	.0038	60400	.0263	.0501	.0282	7610.	010.	.0443
d d	.1230	.0022	.0390	.0200	.0499	.0281	.0193	.0158	.0424
2	1200	6000	.0375	.0253	.0495	.0279	1610.	.0156	.0409
2.50	911.	1950.	.0359	.0241	1040.	.0270	. o188	.0154	.0395
÷ 6	21130	0/5/5	95.0	.0231	. 0467	.0272	.0185	.0152	.0383
9	0001	0543	1120		2040.	9900	2010.	.0149	.0372
3	1000	0530	0200	0208	1470	960	6/10:	7,10.	1050:
4		0150.	.0285	.0201	-/	8320	2710	4 5 5	4000
4	:	. :	.0271	.0195	•		0710.	0130	0324
5	:	:	:	.0189	:	:	· :	.0135	.0324
4	:	:	:	.o184	:	:	:	.0132	916
. 5	:	:	:	6/10.	:	:	:	.0128	.0307
\$;	:	:	:	.o.74	:	:	:	.0124	.0298
*	:	:	:	6910.	:	:	:	.0120	.0289
\$ 6	:	:	:	,o104	:	:	:	.0115	6/20.
3 5	:	:	:	0010	:	:	:	0110.	.0270
2	:	:	:	.0155	:	:	:	,010 <u>4</u>	.0259
7.5	:	:	:	.0150	:	:	:	8600.	. 0248
7 2	:	:	:	4410.	:	:	:	.0002	.0236
3				. 0130			-	.0085	.0223

TABLE 105-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued

City of New York Employees' Retirement Fund, Laborers

				RAT	RATES OF WITHDRAWAL	7			
AGE		RESIGNATION	ATION			DISMISSAL	BSAL		TOTAL ULTIMATS
	$r_{\boldsymbol{v}}q_{(x)}^{(a)}$	$r_{\boldsymbol{w}}q_{(x-1)+1}^{(a)}$	r •• q (a)	req(6)	(e) $\bar{b}_{-\bar{a}}$	**Q(*)	4 a Q(a) +3	*b=,	•q ^(a)
54	:	:	:	.0132	:	:	:	8700.	.0210
52	:	:	:	.0125	:	:	:	.0072	7610.
26	:	:	:	8110.	:	:	:	.0065	.0183
27	:	:	:	1110.	:	:	:	.0059	0/10.
80	:	:	:	oros	:	:	:	.0053	.0158
20	:	:	· :	8000.	:	:	:	.0047	.0145
9	:	:	:	1600	:	:	:	.0042	.0133
19	:	:	:	.0082	:	:	:	.0037	6110.
62	:	:	:	.0073	:	:	:	.0032	Sozo.
3	:	:	:	2 900.	:	:	:	7200.	\$00. —
\$:	:	:	.0051	:	:	:	.0023	4/00.
5	:	:	:	1400.	:	:	:	.0020	1 900.
8	:	:	:	.0031	:	:	:	9100.	.0047
67	:	:	:	.0023	:	:	:	.0013	.0036
8	:	:	:	.0015	:	:	:	1100	9200.
6	:	:	:	6 000.	:	:	:	8000	7100.
2	:	:	:	.0003	:	:	:	900.	6 000.
11	:	:	:	:	:	:	:	400.	7 000:
21	:	:	:	:	:	:	:	88.	.0003
23	:	:	:	:	:	:	:		1000
* 1	:	:	:	:	:	:	:	:	:
2,5	:	:	:	:	:	:	:	:	:
2	:	:	:	:	:	:	:	:	:
2.5	:	:	:	:	:	:	:	:	:
20.5	:	:	:	:	:	:	:	:	:
28	:	:	:	:	:	:	:	:	:
3:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:
70	:	:	:	:	:	:	:	:	:
3 3	:	:	:	:	:	:	:	:	:
\$ 2	:	:	:	:	:	:	:	:	:
200	:	:	:	:	:	:	:	:	:
8	:	:	:	:	:	:	:	:	:
200	:	:	:	:	:	:	:	:	:
80	:	:	:	:	:	:	:	:	:
8	:	:	:	:	:	:	:	:	:
3	:	-				-		 - -	1 1 1

TABLE 105-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued

City of New York Employees' Retirement Fund, Laborers

				,		14	RATES OF DISABILITY	,	
AGE						Wітноит	WITHOUT PENSION		WITH PENSION
	$^{(a)}_{[x]}b_{m{p}}$	dq(a) 4q(x-1)+1	${}^{\boldsymbol{d}}q_{[x-2]+2}^{(a)}$	$^aq_x^{(a)}$	$^{4r}q^{(a)}_{[x]}$	$^{t}q_{[x-1]+1}^{(a)}$	4. q(a)	$^{\epsilon}q_x^{(a)}$	$^{\circ}rq_x^{(a)}$
16	.0044	:	:	:	9000.	:	:	:	
17	.0045	1500.	:	:	.0007	8000	:	:	:
2	.0046	.0052	.0054	:	7000.	8000.	6000	:	:
61	.0047	.0053	.0055	.0056	8000.	6 000.	0I00.	0100.	:
2	.0047	. 0054	.0057	.0057	6000	0100.	1100.	1100.	:
21	.0049	9500.	.0058	.0059	0100.	1100.	1100.	.0012	:
75	.0050	.0057	900.	1900.	0100.	.0012	.0012	.0013	:
23	.0051	6500.	.0062	.0063	1100.	.0013	.0013	4 100.	:
7	.0053	1900.	4 900.	.0065	.0012	4100.	.0015	.0015	:
23	.0055	-0004	.0067	8900.	.0013	.0015	9100.	9100.	:
56	.0058	.000	.0070	1,00.	4100	9100.	.0017	7100.	:
27	1900.	0,000	.0074	.0075	.0015	8100.	6100.	6100.	:
80 6	.0064 4	4/00.	.0078	.0079	9100.	6100.	.0020	.0020	•
200	8000.	.0079	.0083	.0084	8100.	.0021	.0022	.0022	,:
္က ႏ	.0073	.0085	6800.	1600.	6100	.0022	.0023	.0024	:
E	6 <u>7</u> 0	1600.	9600.	2600.	.0021	.0024	.0025	.0020	:
22	.0085	8600.	.0103	.oros	.0022	.0020	.0027	.0028	:
	.000	00100	.0108	4110 .	.0024	.0028	.0030	.0030	:
*	8 600.	,0114	.0120	.0122	.0027	.0031	.0033	.0033	:
32	oros.	.0122	.0128	.0130	.0029	.0034	.0030	.0030	:
8	.0112	.0129	.0136	.0138	.0032	.0037	.0039	.0040	:
25	6110.	.0137	.0144	.or40	.0030	.0041	.0043	4400.	:
20 6	.0127	.0145	.o.52	.0155	0400	.0045	.0048	.0048	:
2 5	.0134	.0153	0010	.0103	440	. 0050	.0052	.0053	•
₹;	.0142	ioio.	8010.	1/10.	.0048	.0055	.0057	.0058	:
-	:	6010.	//10.	6/10.	:	1000	.0003	4000	:
7 5	:	:	Seio.	7810.	:	:	0,000	1,007	:
2 :	:	:	:	0610.	:	:	:	.0078	:
‡;	:	:	:	.0204	:	:	:	.0080	:
Ç.	:	:	:	.0212	:	:	:	•	:
\$:	:	:	:	.0221	:	:	:	,010 4	.0003
41	:	:	:	.0229	:	:	:	, OI 14	6000
4	:	:	:	.0239	:	:	:	.0124	.0017
5	:	:	:	.0248	:	:	:	.0135	.0022
S:		:	:	.0257	:	:	:	.0149	.0029
7.5	:	:	:	.0200	: -	:	:	.0105	.0030
70	:	:	:	.0275	:	:	:	.0184	.0045
3	:		-	.0254			-	.0207	.0053

TABLE 105—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued City of New York Employees' Retirement Fund, Laborers

A _G 55 55 55 59 59 61	φ(a) 	4 (a) 4 (j-1)+1 4 (j-1)+1 4 (j-1)+1 4 (j-1)+1	4 (a) (b) (c) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	$^{a}q_{x}^{(a)}$	(8)	Мітност	WITHOUT PRINSION		WITH PENSION
25 55 55 55 55 55 55 55 55 55 55 55 55 5	(a) D _g	6 (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	<i>d Q</i> (<i>a</i>) <i>β</i>	aq ^(a)	(8)				
45 85 85 85 85 85 85 85 85 85 85 85 85 85			::::::::		$^{r}q_{[x]}^{(a)}$	'rq(a)	$^{\iota_{r}q^{(a)}_{[x-2]+2}}$	$^{x}b_{x}$	°rq ^(a)
58 58 59 60 61			:::::::	.0293	:	:	:	.0232	.0062
5 8 8 8 7 8 5 8 8 8 7 8	:::::::::		:::::::	.0302	:	:	:	.0254	.873
588 60 60 60				0300	:	:	:	6920.	0800
88.00.10			:::::	.0317	:	:	:	.0283	8000.
61 68	::::::	::::::	::::	.0325	:	:	:	.0292	1110.
61	::::::	:::::	:::	.0332	:	:	:	.0297	.0127
	:::::	::::	: :	.0340	:	:	:	.0200	.0145
62	: : : :	:::	:	.0347	:	:	:	9620.	.0165
8	: : :	::		.0354	:	:	:	.0293	.0187
3	::	:	:	.0301	:	:	:	.0284	.0211
92	•		:	.0308	:	:	:	.0272	.0240
3.5		:	:	.0374	:	:	:	.0255	6920.
86	:	:	:	.0362	:	:	:	.0227	.0304
: 2	:	:	:	.0392	:	:	:	6810.	.0343
8 2	:	:	:	.0401	:	:	:	.0147	.0386
38	:	:	:	414o.	:	:	:	0100	.0436
2.5	:	:	:	.0428	:	:	:	.0085	.0490
72	:	:	:	.0440	:	:	:	2900.	.0555
73	:	:	:	.0407	:	:	:	.0054	.0625
7.	:	:	:	.0493	:	:	:	.0044	.0710
75	:	:	:	.0529	:	:	:	.0037	.0810
20	:	:	:	7050.	:	:	:	.0030	.0925
11	:	:	:	6100.	:	:	:	.0025	. 1065
78	•	:	:	2,00	:	:	:	.0020	. 1225
2	•	:	:	64/0	:	:	:	9189	.1400
8	: :	: :	: :	6500	:	:	:	.00.	. 1590
8			•	8801	:	:	:	8	08,11
83	:		•	1230	:	:	:	.0005	5861.
3				2071	:	:	:	700	. 2215
\$: :		:	1693	:	:	:	:	. 2550
82		:	:	901.	:	:	:	:	. 2000
28		:	:	. 1930	:	:	:	:	.3380
87	: :	:	:) 000 0	:	:	:	:	4000
88		: :	:	06/4.	:	:	:	:	.4725
2	•	: :	: :	0002	:	:	:	:	. 5650
8	: :		:	.3300	:	:	:	:	02.0
				2		 	_	:	0008

RATA

RATES OF RESIGNATION AND DISMISSAL

The rates of resignation and dismissal for laborers in the City of New York Employees' Retirement Fund vary materially with years of service where such service is less than three completed years. The rate of resignation during the first year of service is exceeded by the rate for the members of the Health Department and for clerks. In the ultimate years it is exceeded by the same two classes.

Considered as an aggregate rate it ranks fourth among the seven rates, lying between that for mechanics, which is higher, and that for street cleaners, which is lower.

The rate of dismissal is the second highest among such rates, not only for the first year of service but for the ultimate years. It is exceeded by the similar rate for the Street Cleaning Department. The aggregate rate for the Street Cleaning Department is also the highest rate of dismissal of all such rates prepared; consequently the aggregate rate for the division of laborers being next to it ranks second among all departments.

The two aggregate rates for laborers combined give a total rate which ranks third out of eleven such rates prepared; being exceeded by the rate for members of the Health Department and by that of clerks and being followed by the rate for members of the College of the City of New York.

No withdrawal rates for outside services were available to compare with those for laborers. The rate, however, in the ultimate years, follows quite closely an aggregate rate covering the public service of New Zealand exclusive of the employees in the Government Railways' Superannuation and the Teachers' Superannuation Funds. The New Zealand rate is generally lower than that for laborers but the two rates agree very closely between the ages of 42 and 52.

RATE OF DEATH

The rate of death among laborers is the highest, being followed by that of clerks. In age groups 30 to 60 the rate for laborers generally exceeds other rates derived from experience of mixed lives, including the rates upon which standard insurance tables are based; which rates are generally higher than those ordinarily found in the active service branch of pension funds.

The explanation of the comparatively high death rate among laborers may lie partly in the fact that laborers are not granted a pension on disability unless they have served thirty years, and consequently deaths occur among the active employees which in a more liberal fund would occur among disability pensioners; and partly in the fact that the laborers are as a whole the lowest paid class and presumably have therefore, as a class, the lowest standard of living. Many of the deaths may too be caused by accident arising from the more or less hazardous nature of the laborer's employment, but as to this possibility the Commission has no data, for in this service deaths from accident were not distinguished from other deaths. No reduction was made in the rate as developed directly from the experience as the basis was considered sufficiently broad to be reliable.

RATE OF DISABILITY WITHOUT PENSION

A rate of separation on account of disability for laborers among members of the City of New York Employees' Retirement Fund was derived, as has been stated, on the assumption that a certain number of withdrawals recorded as resignations actually occurred because of disability. Roughly 37% of total ultimate withdrawals were assumed to have occurred on account of disability. The rate of disability among members of the Street Cleaning Department was used to indicate the trend of the corresponding rate among laborers. This rate of separation on account of disability for laborers was used only as part of the withdrawal rate, and it is of significance solely as a possible division of the rate of withdrawal.

Taken as a whole the rate ranks fourth out of ten rates of disability prepared, being exceeded by the rates for the Police, Street Cleaning and Fire Departments.

RATE OF SERVICE RETIREMENT

A comparatively low rate of retirement was adopted for laborers. The actual experience in regard to their retirement, limited to the two years—1913 and 1914—seemed to indicate even a lower rate than the one adopted. The experience of the laborers who participated in the fund of the Street Cleaning Department seems to indicate that a high rate of retirement, as compared with the rates for the other groups of employees considered under the various city pension funds, is not to be expected among laborers. Among the twelve retirement rates prepared, the one adopted for laborers up to age 65 ranks next to the lowest, which is that for street cleaners.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

The active service—mechanics

The following table shows the rates that were used for mechanics and skilled workmen among the members of the City of New York Employees' Retirement Fund. As has been stated, these rates were based on the experience for men, but used for both men and women. To visualize the increases and decreases in these rates from age to age and to show their relative importance at various ages, diagrams showing the rates plotted on cross section paper are given on pages 206 to 208.

TABLE 106—RATES OF SEPARATION FROM ACTIVE SERVICE

Fund-Mechanics
Retirement
Employees,
York
of New
City

				2	RATES OF WITHDRAWAL	Y.			
YC#		Redgn	eignation			Dismissel	Lensi		Total Ultimate
	r ** q (a)	$r_{\boldsymbol{w}}q_{(\boldsymbol{x}-1]+1}^{(a)}$	$r = q^{(a)}$	$r_{\mathbf{e}}q_{x}^{(a)}$	4 w q (a)	d w q (s)	d w Q (x-2)+2	* pa**	* qz
16	.0700	:	:		.0155	:		:	:
17	.0013	0250.	:	:	.or 56	.0148	:	:	:
81	6660	.0663	.0473	:	.0157	.0149	.0136	:	:
19	. 1068	.0731	.0535	.0286	.0159	.0150	.0137	8110.	.0404
2	.1120	.0785	.0589	.0333	0010.	.0152	.0138	5110.	.0448
77	.1158	.0825	.0631	.0402	.0162	.0154	.0139	2110.	.0514
77	0611.	.0859	8990.	.0525	7910.	.0157	.0140	.010	.0634
23	0121.	.0885	9690.	.0584	1/10.	0010.	.0141	9010.	00000
*	.1240	6060	.0715	.0500	.0178	.0163	.0143	4 010.	.0703
25	.1257	.0925	.0724	0000	.0185	8910.	.0145	2010.	.0702
56	.1267	.0935	.0724	.0585	8610.	.0172	.0147	.0100	.0685
27	.1270	.0940	0170.	.0551	.0208	8/10.	.0148	8000.	.0649
38	.1262	.0935	8890.	.0492	.0222	.0184	.0149	2600	. 0589
53	.1248	6160.	.0657	.0427	.0240	.0193	.0151	\$600.	.0522
8	.1213	6880.	.0620	.0363	.0259	.0202	.0152	4600.	.0457
31	1711.	.0855	.0577	.0324	.0280	.0212	.0153	.0003	.0417
32	.1125	6180.	.0536	6620.	.0305	.0223	.0154	.0003	.0391
33	1074	.0775	.0491	.0280	.0335	.0234	.0155	1600.	.0371
4	. 1021	.0729	.0453	.0266	6980.	.0247	.0156	0 0 0 0	.0356
32	.0963	.0683	.0420	.0255	.0407	.0258	.0157	0890	.0344
36	.0913	.0639	.0390	.0245	.0450	.0267	.0157	88 6	.0333
37	.0862	\$650.	.0365	.0237	.0490	.0276	.0156	.0087	.0324
80	.0812	.0552	.0341	.0229	.0528	.0283	.0155	.0087	.0316
5	.0762	.0517	.0323	.0223	.0553	.0290	.o154	9800	.0300
9	.0722	.0482	.0308	.0217	.0571	.0292	.0153	9800.	.0303
4.	:	.0452	.0291	.0212	:	.0294	.0152	.0085	7620.
7	:	:	.0279	.0205	:	:	.0151	900	6920.
	:	:	:	8610.	:	•	:	.0084	.0282
‡ :	:	:	:	.0192	:	:	:	.0083	.0274
\$:	:	:	.0183	:	:	:	1809.	.0264
\$:	:	:	.0172	:	:	:	.0079	.0251
44	:	:	:	.0157	:	:	:	.0075	.0232
4	:	:	:	.0131	:	:	:	1/00.	.0202
9	:	:	:	1110.	:	:	:	,000 4	.0175
20	:	:	:	.0077	:	:	:	.0053	.0130
21	:	:	:	.0046	:	:	:	0032	.0078
27	::		:	.0032				1200.	.0053

TABLE 106—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued

City of New York Employees' Retirement Fund-Mechanics

				R	Rates of Witedrawal	'AI,			
Age		Resignation	ation			Dian	Dismissal		Total Ultimate
	$r_{oldsymbol{v}}q_{[x]}^{(a)}$	req(a)	r w q (a)	r w q *	$d_{w}q_{[x]}^{(a)}$	4 w Q (a)	d w q(a)	(y) Dan p	* q (a)
SS	:	:	:	.0023	:	:	:	.0014	.0037
3	:	:	:	9100.	:	:	:	6000	.0025
22	:	:	:	.0012	:	:	:	9000	8100.
S	:	:	:	8000	:	:	:	.000 5	.0013
57	:	:	:	9000	:	:	:	.0003	600°.
80 E	:	:	:	9 000.	:	:	:	.0003	7000.
8	:	:	:	.0003	:	:	:	.000	000.
8	:	:	:	.003	:	:	:	1000.	7 000.
19	:	:	:	.000	:	:	:	1000.	.0003
25	:	:	:	1000	:	:	:	1000	.0002
8	:	:	:	1000.	:	:	:	:	1000
\$:	:	:	1000	:	:	:	:	1000.
3	:	:	:	:	:	•	:	:	:
8	:	:	:	:	:	:	:	:	:
6	:	:	:	:	:	:	:	:	:
8	:	:	:	:	:	:	:	:	:
38	:	:	:	:	:	:	:	:	:
2:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:
25	:	:	:	:	:	:	:	:	:
2.5	:	:	:	:	:	•	:	:	:
:	:	:	:	:	:	•	:	:	:
2.5	:	:	:	:	:	•	:	:	:
2 5	:	:	:	:	:	•	:	:	:
2	:	:	:	:	:	:	:	:	:
9.0	:	:	:	:	:	:	:	:	:
2.5	:	:	:	:	:	:	:	:	:
200	:	:	:	:	:	:	:	:	:
56	:	:	:	:	:	:	:	:	:
25 62	:	:	:	:	:	:	:	:	:
33	:	:	:	:	:	:	:	:	:
\$ 6	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:
88	:	:	:	:	:	:	:	:	:
/9						-			:-

TABLE 105-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued

City of New York Employees' Retirement Fund, Laborers

				RATES OF WITEDRAWAL	RATES OF WITEDRAWAL	-			
AGE.		RESIGNATION	ATION			DISECTSAL	BAL		TOTAL ULRIMATS
	**************************************	$req_{(x-1)+1}^{(a)}$	7 * Q(5)	r.g.(6)	6 w Q (a)	4 wq(4)	**************************************	€ • q (*)	• $q_x^{(a)}$
\$:	:	:	.0132	:	:	:	8200.	.0210
55	:	:	:	.0125	:	:	:	.007	7610.
92	:	:	:	8110.	:	:	:	2900.	.0183
57	:	:	:	1110.	:	:	:	65∞.	0,10.
88 8	:	:	:	.oloş	:	:	:	.0053	.0158
20.0	:	:	:	8600·	:	:	:	.0047	.0145
3:	:	:	:	1000.	:	:	:	.0042	.0133
5	:	:	:	.0082	:	:	:	.0037	6110.
2 9	:	:	:	.0073	:	:	:	.0032	. oios
23	:	:	:	.0002	:	:	:	.0027	6800
\$ 3	:	:	:	.0051	:	:	:	.8033	4/8
83	:	:	:	.0041	:	:	:	.000	1000
8	:	:	:	.0031	:	:	:	9 100.	.847
26	:	:	:	.0023	:	:	:	.8013	.8030
2	:	:	:	.0015	:	:	:	1100.	. 0020
3	:	:	:	%	:	:	:	800.	7100.
2.2	:	:	:	.0003	:	:	:	900	6 00.
7.	:	:	:	:	:	:	:	7 000.	8
2.2	:	:	:	:	:	:	:	.003	.08
2.3	:	:	:	:	:	:	:	1000	8.
*:	:	:	:	:	:	:	:	:	:
21	:	:	:	:	:	:	:	:	:
21	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:
0 8	:	:	:	:	:	:	:	:	:
2 8	:	:	:	:	:	:	:	:	:
3 8	:	:	:	:	:	:	:	:	:
56	:	:	:	:	:	:	:	:	:
26	:	:	:	:	:	:	:	:	:
33	:	:	:	:	:	:	:	:	:
\$:	:	:	:	:	:	:	:	:	:
6 6	:	:	:	:	:	:	:	:	:
2 6	:	:	:	:	:	:	:	:	:
> &	:	:	:	:	:	:	:	:	:
8 8	:	:	:	:	:	:	:	:	:
8	:	:	:	:	:	: _	<u>:</u>	:	:
									-

TABLE 105-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued

City of New York Employees' Retirement Fund, Laborers

						7	RATES OF DISABILITY		
AGE			Hive			Wітно	WITHOUT PRISION		WITH PENSION
	(a) (b)	•q(a)	⁶ Q ^(a) _{(x-2)+2}	4q(a)	$^{4}_{r}q_{[x]}^{(a)}$	$^{\epsilon_r}q_{(x-1]+1}^{(a)}$	67 Q(a)	$^{\epsilon_{7}q_{x}^{(a)}}$	°rq(a)
16	.0044	:			9000.	:	:	:	
17	.0045	1500.	:	:	.000	8000.	:	:	:
18	9400.	.0052	.0054	:	7000.	8000.	6000	:	:
10	.0047	.0053	.0055	.0056	8000.	6000	0100.	0100.	:
20	.0047	.0054	.0057	.0057	6000.	0100	1100.	1100.	:
21	.0049	.0056	.0058	6500.	0100.	1100.	1100.	.0012	:
22	.0050	.0057	900	1900	0100.	2100.	.0012	.0013	:
ដ	.0051	.0059	.0062	.0063	1100.	.0013	.0013	4 100.	:
*	.0053	1900.	4900.	.0065	.0012	4100.	.0015	.0015	:
25	.0055	7900.	2900.	8900	.0013	.0015	9100.	9100.	:
50	.0058	2900.	.0070	1,000.	.00I4	9100.	.0017	7100.	:
27	1900.	0,000	4/00.	.0075	.0015	8100.	6100.	6100.	:
88	.0064	.0074	.0078	6200.	9100.	6I00.	.0020	.0020	:
8	9900.	6,000	.0083	.0084	8100.	.0021	.0022	.0022	, :
8	.0073	.0085	6800.	1600	6100.	.0022	.0023	.0024	:
31	0 2 0 7 0	1000	9600.	.0007	.0021	.0024	.0025	.0026	:
32	.0085	8600.	.0103	Solo.	.0022	.0026	.0027	.0028	:
8	.000	9010.	8010.	7 110.	.0024	.0028	.0030	.0030	:
*	860°.	,0114	.0120	.0122	.0027	.0031	.0033	.0033	:
200	.0105	.0122	.0128	.0130	.0020	.0034	.0030	.0030	:
5 1	.0112	.0129	.0130	.0138	.0033	.0037	.0039	.0040	:
37	6IIO.	.0137	.0144	.0140	.0030	.0041	.0043	4400	:
9 6	7210.	.0145	.0152	or55	040	.0045	000	.0040	:
20 0	.0134	.0153	0010	.0103	4400	.0050	.0052	.0053	:
? ;	.0142	1010.	.010s	1/10.	.0040	.0055	.0057	.0058	:
1 9	:	oro.	.0177	6210.	:	1000.	.0003	4000	:
7 .	:	:	.0185	.0187	:	:	0,00	100	;
2:	:	:	:	0010.	:	:	:	.0078	:
‡;	:	:	:	.0204	:	:	:	0800	:
.	:	:	;	.0212	:	:	:	.0004 4600	:
ŧ:	:	:	:	.0221	:	:	:	,010 4	.0003
47	:	:	:	.0220	:	:	:	7 110.	боо. -
\$ 6	:	:	:	.0239	:	:	:	.0124	7100.
9.0	:	:	:	.0248	:	:	:	.0135	.0022
3:	•	:	:	.0257	:	:	:	.0149	.0039
7.5	:	:	:	.0200	:	:	:	.o.65	.0030
7 5	:	:	:	.0275	:	:	:	.0184	.0045
3				.0254				.0207	.0053

TABLE 105-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued City of New York Employees' Retirement Fund Laborers

Addia Addi			RATES OF DEATH	DRATH			1	RATES OF DISABILITY		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	AGE						WiтноUT	PENSION		WITH PENSION
0303 0303 0303 0303 0303 0304 0304 0304		^d Q _[z]	4q(2-1)+1	$^{d}q_{[x-2]+2}^{(a)}$	$^{a}q_{x}^{(a)}$	$^{(r)}q_{(x)}^{(a)}$	(rq(a)	frq(a)	$^{\prime r}q_x^{(a)}$	orq(a)
0.300 0.317	*	;	:	:	.0293	:	:	:	.0232	2000.
03100 0317 0317 0317 0317 0318 0318 0318 0318 0318 0318 0318 0318		:	:	:	.0302	:	:	:	.0254	.007
0.337 0.337 0.337 0.337 0.337 0.338 0.338 0.338 0.338 0.338 0.338 0.338 0.338 0.338 0.338 0.348	20	:	:	:	.0300	:	:	:	9200	0800
0.335 0.335 0.337 0.347	, as	:	:	:	.0317	:	:	:	.0283	8000.
0.347 0.347	9 9	:	:	:	.0325	:	:	:	.0202	1110.
0.034 0.034 0.034 0.034 0.034 0.037 0.037 0.037 0.037 0.037 0.037 0.0438	3 8	:	:	:	.0332	:	:	:	.0297	.0127
0.347 0.347 0.347 0.348	3 6	:	:	:	.0340	:	:	:	.0209	.0145
0.354 0.354 0.355 0.354 0.355 0.355 0.357	- 25	:	:	:	.0347	:	:	:	8020.	5010.
0.034 0.038 0.038 0.037 0.037 0.037 0.037 0.037 0.044 0.044 0.044 0.044 0.047 0.047 0.047 0.057		:	:	:	.0354	:	:	:	.0293	.0187
0372 0374 0374 0374 0374 0375 0378 0378 0378 0378 0378 0378 0378 0378	3	:	:	:	.0301	:	:	:	.0284	1170.
0.3574 0.	65	:	:	:	.0300	:	:	:	.0272	.0240
0.0302 0.0401 0.0401 0.0402 0.0403 0.0446 0.0446 0.0529 0.0529 0.0529 0.0539		:	:	:	.0374	:	:	:	.0255	6920.
0.5994 0.4144 0.4446	67		:	:	.0302	:	:	:	.0227	.0304
0.414 0.428 0.446 0.	8		:	:	1050	:	:	:	6810.	.0343
0446 0446 0446 0446 0446 0446 0446 0529 0630	3	: :		:	1040	:	:	:	.0147	.0386
0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0	20	:		: :	200	:	:	:	6010	.0430
0.467 0.493 0.493 0.493 0.653 0.	71	:	:	•	0446		:	:		0490
0.0493 0.0529 0.0544 0.0547 0.0549 0.0547 0.0549 0.0544 0.0544 0.0549 0.0549 0.0544 0.0549 0.0549 0.0544 0.0549	72	:	:	:	.0467	: :		:	38.	.0555
0.0529 0.0567 0.0567 0.0567 0.0567 0.0567 0.0567 0.0567 0.0567 0.0567 0.0567 0.0568	73	:	:	:	.0403	:			0044	2.5
0.0567 0.0519 0.0748 0.0838 0.0950 0.0950 0.0008	4.4	:	:	:	.0529	:	:	:	.0037	080
		:	:	:	.0567	:	:	:	.0030	.0026
	19	:	:	:	6190	:	:	:	.0025	1065
0.0016 0.0013 0.0013 0.0008 1.1008 1.1009		:	:	:	.0075	:	:	:	.0020	.1225
00338 1038 1039 1030	20	:	:	:	.0748	:	:	:	9100.	.1400
	: 2	:	:	:	.0838	:	:	:	.0012	0651.
1230 14495 1620 1620 1630 1730 1830 1830 1830 1830 1830 1830 1830 18		:	:	:	0950	:	:	:	8000.	. 1780
1495 1495 1620 1620 1730 1730 1730 1730 1730 1730 1730 173	-	:	:	:	. 1038	:	:	:	.0005	. 1985
1495 1620 1630 1930 110 1310 1310		:	:	:	. 1230	:	:	:	1000	. 2215
1020 1030 1030 1030 1030 1030 1030 1030	3 2	:	:	:	. 1495	:	:	:	:	. 2550
1930 110 110 110	- -	:	:	:	. 1020	:	:	:	:	2000
3330		:	:	:	. 1930	:	:	:	:	.3380
3110		:	:	:	. 2330	:	:	:	:	.4000
0116		:	:	:	. 2730	:	:	:	:	.4725
2000	2	:	:	:	3110	:	:	:	:	. 5650
	-	:	:	•	.3200	:				4

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RATE OF RETIREMENT

The rate of retirement as adopted for the mechanics of the City of New York Employees' Retirement Fund fell between the rate for the men teachers and that for the clerks of the same fund. The rate of retirement for mechanics followed more closely the rate for the clerks than that for laborers, as such a course was indicated by the experience of the years 1913 and 1914. The rate taken as a whole up to age 65 is very low, the only lower rates being those for clerks, the members of the College of the City of New York, for laborers and for street cleaners.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

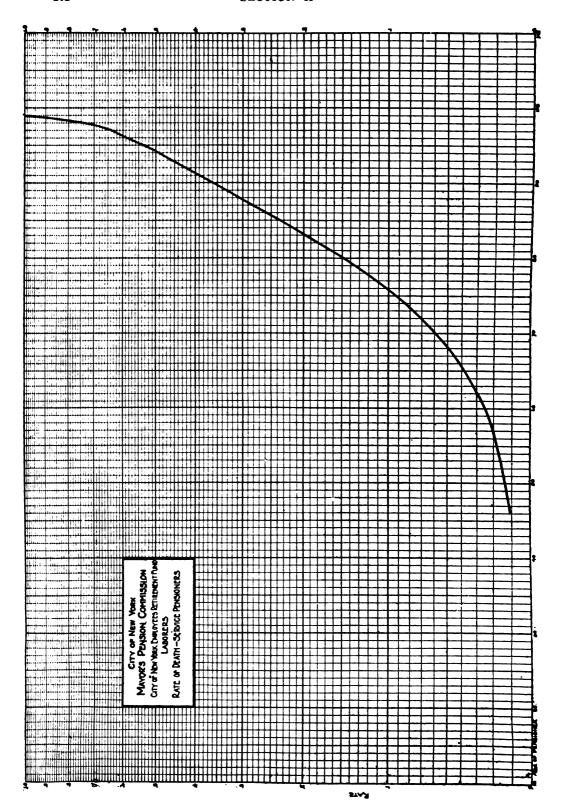
Pensioners—all classes

The following table shows the rates used in the construction of mortality tables for pensioners of each of the three divisions—clerks, laborers, and mechanics—of the City of New York Employees' Retirement Fund. Diagrams showing the rates of mortality plotted on cross section paper are given on pages 211 to 213.

TABLE 107—RATES OF MORTALITY AMONG PENSIONERS

City of New York Employees' Retirement Fund

Age	Laborers	Mechanics	Clerks	Age	Laborers	Mechanics	Clerks
45	.0112	.0113	.0125	73	.0802	.0756	.0726
46	.0116	.0118	.0120	74	.0870	.0823	.0786
47	.0120	.0124	.0135	75	.0044	.0803	.0852
48	.0125	.0132	.0141	76	. 1023	.0976	.0024
49	.0131	.0138	.0147	77	.1111	.1060	.1002
50	.0138	.0145	.0154	78	. 1 208	.1146	. 1087
51	.0145	.0153	.0162	79	.1317	.1238	.1170
52	.0154	.0162	.0170	80	.1445	.1338	. 1279
53	.0163	.0172	.ožio.	81	. 1586	.1456	. 1387
54	.0174	.0180	.0100	82	.1743	. 1585	. 1505
55	.0186	.0194	.0201	83	. 1916	.1723	. 1631
56	.0100	.0206	.0213	84	.2114	.1883	. x 768
57	.0213	.0220	.0227	85	. 2356	.2060	. 1915
58	.0229	.0237	.0241	86	. 2657	.2250	. 2074
59	.0247	.0253	.0258	87	.3030	.2440	. 2244
60	.0267	.0272	.0275	88	.3467	. 2640	. 2426
61	.0289	.0293	.0294	89	-3959	. 2890	. 2621
62	.0313	.0314	.0315	90	.4545	.3160	. 2830
63	.0339	.0338	.0338	91	.5325	.3440	. 3051
64	.0369	.0366	. 0364	92	.6343	.3730	. 3286
65	.0401	.0397	.0391	93	.7342	.4040	-3535
66	.0437	.0428	.0421	94	.8571	.4390	3797
67	.0476	.0462	.0454	95	I.0000	.4770	.4072
68	.0520	.0498	.0490	96		. 5200	-4359
69	.0568	.0540	.0529	97		. 5670	.4659
70	.0620	.0583	.0572	98	• • • •	.6220	.4969
71	.0677	.0638	.0619	99	• • • •	.6780	. 5288
72	.0737	.0696	.0670	100		.7400	.5615



PENSIONERS' DEATH RATE-CLERKS

McClintock's rate of mortality for male annuitants was assumed to reflect the mortality among pensioned clerks.

PENSIONERS' DEATH RATE-LABORERS

The American Experience rate of mortality was assumed to reflect the rate of mortality among pensioned laborers.

Pensioners' death rate—mechanics

The rate of death for pensioners among mechanics was an adopted rate which fell between the assumed rate for pensioners among laborers and that assumed for pensioners among clerks.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following tables are based on the rates discussed above, with the exception of the salary scales shown in connection with the active service tables. The salary scales were developed directly from the tabulation of employees' salaries.

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_			Lrypia			WITHDRAWALS	VALS	
						RESIGNATIONS	8400	
У	<u> </u>	(a) (a-1)+1	/(a) /(a-2)+3	(a) ?	9 (a)	7 29 (d) 5-11+1	rev (a) (a-2)+3	(a) (b)
91	1,000,000	:	:	:	74,900		:	:
17	958,069	906,835		:	84,310	64,566		:
9 5	912,497	955,700 803 138	020,045		201,20	99,141	52,217	
2	816.027	750.356	710.000	710.814	90,023	60.850	52,373	45,712
ដ	769,816	100,164	668,743	658,902	100,076	67,986	48,885 S85	40,193
2	723,617	652,917	620,020	610,340	96,136	65,945	46,508	37,109
ឌ	678,624	608,003	276,171	265,266	96,704	63,111	43,674	33,916
7	635,608	265.770	534,602	523,764	93,625	59,858	40,683	30.054
6 8	594.030	520,043	490,029	485,50I	90,087	50,234	37,098	28,308
3 6	555,535	400,075	400,263	450,343	95,997	52,407	34.751	25,850
. 8	282.041	424.100	206.740	287.045	26.804	46,04	31,904	23,010
2	440,020	301.606	168,242	360,366	73.214	43,432 A1,432	26,514	10,604
8	418,633	363,519	342,045	334.971	67,400	37,842	23,977	17,820
.	389,252	337,484	317,894	311,597	62,631	34.457	21,585	16,203
	301,097	313,400	295,503	200,072	57,944	31,246	19,267	14,707
3 3	330,100	201,050	274,901	274,200	33,430	20,110	17,209	13,350
35	280,006	251,455	248,717	235,241	44.688	22,354	13,483	10,821
36	269,758	234,182	222,758	219,889	40,760	19,882	11,984	9,763
37	250,936	218,414	208,223	205,761	36,938	17,648	10,598	8,745
10 C	233,995	203,980	194,959	192,806	33,461	15,503	9,358	7,789
3 \$	\$10,712	191,005	102,050	190,939	29,370	13,752	9,205	0,670
₹	201	168,620	161.873	160.155	contrar -	19,707	6,507	5,237
42	:	• :	152,887	151,174	:	: :	5,825	4,535
\$:	:	:	142,973	:	:	:	3,889
‡	:	:	:	135,486	:	:	:	3,374
3	:	:	:	128,571	:	:	:	2,932
\$:	:	:	:	122,133	:	:	:	2,553
÷:	:	:	:	110,024	:	:	:	2,239
\$ 6	:	:	•	110,121	:	:	:	9,0
2 5	:	:	:	104,305	:	:	:	1,701
3 5	:	:	:	90,700	:	:	:	1,404
3		•	: :	27.7.72	•			80.1
3	:	•			-			}

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TABLE 108—SELECT ACTIVE SERVICE AND SALARY SCALE—Continued City of New York Employees' Retirement Fund-Clerks

		(e) 224 £	162	049	567	984	401	330	272	205	7/1	150	.8	43	24	∞	:	:	:	:	:	:	:	:	:	::	:	:	:	:	:
ALS	NS.	****(a) ********************************	:	:	:	:	:	:	:	:	:	: :		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
WITHDRAWALS	RESIGNATIONS	'w(z-1]+1	:	:	:	:	:	:	:	:	:	: :		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
		(8) (8)		:	:	:	:	:	:	:	:	: :		:	:	:	:	:	:	:	:	•	:	:	:	:	:	•	•	:	
) (g)	77,581	72,838	68,310	04,013	116,92	50,05	52,290	40,734	40,000	10,018	36.062	33,241	30,550	27,984	25,524	23,155	20,855	18,595	10,337	14,000	11,473	8,840	0,293	3,092	2,107	906	320	7.	6
or man to find	Living	l(a) l(5-2)+2		:	:	:	:	:	:	•	:	: :		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Ľ	l(≠11+1	:	:	:	:	:	:	:	:	:	: :	: :	•	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	::
		(a) f		:	:	:	:	:	:	:	:	: :		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
		YCR	35	55	92 :	22	% G	R &	3 2	7 69	.	3 2	9	98	29	88	8	0. 2	22	2.6	2;	t i	C 1	2 :	2	8 1	28	8 8		7 6	3

TABLE 108—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued City of New York Employees' Retirement Fund-Clerks

			WITHDRAWALS				SEPARATIONS	SEPARATIONS BY DISABILITY	SALARY
		Disars	ISSALS		Total Ultimate	Deaths	Without Pengion	With Pension	SCALE
AGE	(a)	60(a)	€w(a) -21+3	(e) at p	(9) sr 88	$\begin{array}{c} d(s) \\ d(z) \\ d(z-1)+1 \\ d(z-2)+3 \\ d(z) \end{array}$	7 7 7 7 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3	S 40	S _[x] S _{[x-1]+1} S _{[x-2]+2} S _x
16	13,800		:	::	:	4,230	235	:	311
7 8	13,005	8,978	6 547	:	:	4,202	7 %	:	340
9	13,414	8,100	6,180	4.023	50,625	2.082	908	: :	470
8	12,989	7,654	5,832	4,656	47,802	3,838	271	: :	580
22	12,856	7,282	5,551	4,402	44,595	3,690	277	:	8,0
77	12,003	0,0%	5,340	4,150	41,259	3,540	275	:	818
3 2	12,457	0,027	5,070	3,923	37,839	3,392	271	:	026
, c	12,394	0,337	4,012	3,703	34,057	3,274	272	:	1,020
200	12.055	0010	4.327	9000	20.128	2.052	270		1.163
27	11,816	5,540	4,188	3,097	26,707	2,963	267	: :	1,213
28	11,496	5,315	3,928	2,913	24,444	2,871	264	:	1,250
0 0	11,158	2,091	3,719	2,753	22,357	2,775	263	:	1,288
3.5	10,001	4,035	3,523	2,000	20,420	2,090	6 20	:	1,320
33	0.010	4,388	3,101	2,320	17.027	2,527	2,50	: :	1,176
33	9,480	4,191	2,997	2,195	15,545	2,454	262	:	1,400
*	0000	3,977	2,842	1,071	14,117	2,381	260	:	1,425
32	8,555	3,772	2,674	096'1	12,781	2,308	263	:	1,448
S 5	000'8	3,500	2,495	1,847	010,11	2,247	271	:	1,470
\ C	7,553	3,342	2,353	1,745	10,490	2,109	270	:	1,409
9 6	9,014	2,000	2.066	1.438	8.44.0	2,117	201	: :	1.520
\$	6,187	2,813	1,025	1.444	7.568	2,003	301	:	1.547
7	· · :	2,631	1,797	1,349	6,586	2,082	313	:	1,563
42	:	:	1,682	1,259	5,794	2,079	328	:	1,579
₹	:	:	:	1,170	5,059	2,087	341	:	1,590
‡	:	:	:	1,084	4,458	2,100	357	:	109'1
4 5	:	:	:	86 86	3,930	2,130	378	:	1,609
\$:	:	:	:	116	3,464	2,172	6	73	1,615
*	:	:	:	825	3,004	2,222	420	197	1,018
? 3	•	:	•	147	2,090	2,205	4,	215	1,010
20.	: :	: :	: :	1 & X	2,000	2,410	401	2 6	210,1
51	::	:	::	, S	1,776	2,525	230	597	1,612
23	:	:	:	439	1,527	2,458	547	949	119'1
23	:	:	:	375	1,300	2,374	267	743	019'1

TABLE 108-SELECT ACTIVE SERVICE TABLE AND SALARY SCALE-Continued

City of New York Employees' Retirement Fund-Clerks

			WITHDRAWALS				SEPARATIONS	SEPARATIONS BY DISABILITY	
ı		Disaris	HSSALS		Total Ultimate	Deaths	Without Pension	With	SALARY
AG#	(s)	$d_{T^{-1}]+1}^{(a)}$	610(a)	\$ (a)	(9) H (8)	6 (8) 6 (9) 6 (9) 6 (9-2) 6 (8)	\$ \$	(a) de	\$ [2] \$ [2-1]+1 \$ [2-2]+3
22				318	1,100	2,261	573	8	1,610
55	:	:	:	268	938	2,163	267	98	019'1
26	:	:	:	224	162	2,053	552	0	019'1
27	:	:	:	186	999	1,952	230	954	00,1
88 (:	:	:	153	554	1,845	203	1,007	6 3
200	:	:	:	125	455	1,753	473	1,031	2005
8:	:	:	:	102	374	000'1	439	1,063	96,1
	:	:	:	8 3	205	605,1	904	1,121	2000
25	:	:	:		235	1,403	000	1,157	903.1
33	:	:	:	4 3	200	1,394		1,192	966.
\$ 1	:	:	:	9	130	1,307	000	1,225	1,593
2	:	:	:	27	8.	1,223	247	1,255	1981
8	:	:	:	19	03	1,143	500	1,204	1,590
2	:	:	:	13	37	1,003	158	1,308	1,589
8	:	:	:	9 0	91	986	120	1,338	1,589
8	:	:	:	•	*	116	20	1,366	1,588
2	:	:	:		H	830	og o	1,398	1,580
71	:	:	:	:	:	192	41	1,452	1,582
72	:	:	:	:	:	9	**	1,534	1,581
73	:	:	:	:	:	623	7,	1,683	1,580
74	:	:	:	:	:	558	<u>e</u>	1,901	1,579
75	:	:	:	:	:	493	I	2,123	1,577
76	:	:	:	:	:	‡	7	2,105	1,570
77	:	:	:	:	:	393	~	1,904	1,574
78	:	:	:	:	:	316	~	1,507	1,572
2	:	:	:	:	:	211	H	166	1,571
2	:	:		:	:	113	:	525	1,570
81	:	:	:	:	:	43	:	<u>5</u>	1,569
2	:	:	:	:	:	11	:	54	1,500
•						•	:	-	1.503

New York Employees' Retirement Fund-Laborers
New York Employees' Retirement Fu
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_			Cutat.			WITEDRAWALS	IWALS	
						RESIGNATIONS	OMS	
AGE	<u> </u>	$h_{[x-1]+1}^{(a)}$	h(==31+3	(p) (? w (a)	°w(a) +1	E+[E-2]	?w(e)
16	1,000,000	:	- :	:	104,000	:	:	:
17	950,148	836,402	:	:	104,516	\$0,100	:	:
18	899,770	789,135	756,139	:	103,474	49,321	30,170	7 9.
9 6	848,435	742,841	711,204	704,631	101,303	48,210	30,155	20,700
3 5	740,090	090,079	624 886	000,000	90,105	40,329	20,077	25,242
: 2	702,674	610,270	584.325	578,280	90,575	42,048	27,607	24,057
ន	658,059	570,425	545,761	239,060	86,140	39,701	26,251	22,679
74	615,561	532,856	500,605	503,820	81,316	37,300	24,818	21,110
25	576,123	497,671	475,719	470,024	76,624	34,837	23,263	19,500
9 1	530,921	405,217	444,153	430,540	72,102	32,505	21,032	16.130
787	504,300	434,702	287.02	282.502	62.067	30,250	20,133	14,535
2	442,607	181,080	367,922	357,744	48,460	25,014	16,800	12,915
30	415,065	357,527	340,321	335,059	54,290	23,954	15,349	11,426
31	389,851	335,736	319,447	314,269	20,369	22,158	14,056	10,119
60 c	305,913	315,707	300,070	295,130	40,017	20,525	12,003	0,013
3 3	343,071	290,032	202,321	277.514	42,993	17.283	11,547	6.048
35	303,255	263,126	250,102	246,006	36.633	16,025	0,382	6,226
36	284,753	247,518	235,667	231,938	33,6or	14,628	8,460	5,590
37	267,172	233,047	221,934	218,652	30,725	13,470	7,546	5,051
æ (250,049	219,286	200,088	200,132	28,073	12,280	0,810	4.597
9 4	235,113	200,314	190,920	184,205	25,027	11,203	6,124	2.808
.	****	182,385	174.546	172,460	1000	0,302	4.074	3,466
42	:	? :	164,187	162,361	•	:	4.450	3,163
5	:	:	:	152,765	:	:	:	2,884
‡ :	:	:	:	143,639	:	:	:	2,046
.	:	:	:	134,940	:	:	:	2,410
\$;	:	:	:	120,008	:	:	:	2,200
}	:	:	:	110,739	•	:	:	20,0
? Q	:	:	:	111,130	•		•	1991
9	: ;	•	: :	90,90	: :	: :		1.400
51	::		: :	080,00	::	:		1,349
52	:	:	:	83,649	:	:	:	1,207
S	- -	:	:	77,461	:		:	1,071

TABLE 109—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

Age 554 SS		Living				WITHDRAWALS	MALS.	
Ags 54								
Ags 54			זאס			RESIGNATIONS	SNO	
\$5 SS	J(a)	H(0) H=-1]+1	l(=2)+3). 13	°w(a)	rw(a) [2-1]+1	rw(6) [x-2]+2	rw(a)
55	:			915,17		:		942
	:	:	:	65,820	:	:	:	821
25 i	:	:	:	60,389	:	:	:	713
57	:	:	:	55,274	:	:	:	010
	:	:	:	50,477	:	:	:	530
n (:	:	:	40,008	:	:	:	154
3 5	:		:	41,803	:	:	:	380
10	:	:	:	30,020	:	:	:	313
2 5	:	:	:	34,494	:	:	:	251
32	:	:	:	31,255	:	:	:	1 61
5 4	:	:	:	26,300	:	:	:	143
6	:	:	:	25,002	:	:	:	So :
8 \$:	:	:	23,140	:	:	:	~ ~
ò 3	:	:	:	20,025	•	:	•	4 6
	:	:	:	12,71	:	•		ì
38	:	:		16.422	: :	•		; ◄
	: :			12.870	: :			•
2	::	: :	: :	12,383	: :		::	:
73	:	:	;	196'01	:	:	:	:
74	:	:	:	9,592	:	:	:	:
75	:	:	:	8,272	:	:	:	:
92	:	:	:	7,013	:	:	:	:
77	:	:	:	5,815	:	:	:	:
78	:	:	:	4,008	:	:	:	:
2	:	:	:	3,081	:	:	:	:
3	:	:	:	2,783	:	:	:	:
150	:	:	:	2,021	:	:	:	:
60 6	:	:	:	1,399	:	:	:	:
3 3	:	:	:	617	:	:	:	:
*	:	:	:	240	:	:	:	:
~	:	:	:	200	:	:	:	:
	:	:	:	140	:	:	:	:
26	:	:	:	52	:	::	: :	•
80	:	:	:	 	• •			

1-Laborers	
Fun	
Retirement	
Employees'	
York	
Ne Ne	
City of	
J	

			WITEDRAWALS			(SEPARATIONS BY DISABILITY	BY DISABILITY	
		DISMISSALS	SALS		TOTAL ULTIMATE	DEATHS	WITHOUT PENSION	WITH PRINSION	SALARY SCALE
V G E	€w(a)	€ (p(0) [F·1]+1	6w(a) [2-2]+2	6 w(a)	(e) 3	$d^{(a)}_{\{x\}}$ $d^{(a)}_{\{x-1\}+1}$ $d^{(a)}_{\{x-2\}+2}$ $d^{(a)}_{x}$	7, 7, 18, 18, 18, 18, 18, 18, 18, 18, 18, 18	o _f (6)	\$\begin{align*} \sigma_{\begin{subarray}{c} S_{\{2^-1\}} + 1 \\ \sigma_{\begin{subarray}{c} S_2 - 2 \end{subarray}} \sigma_{\begin{subarray}{c} S_2 \end{subarray}} \end{subarray}
16	24.600			:	:	4,393	, foos	:	250
17	51,593	25,259	: :	•	:	4,262	642	:	360
18	48,677	23,832	16,560	:	:	4,112	999	:	447
61	45,816	22,360	15,504	12,380	39,086	3,946	169	:	SiS
9	42,937	20,970	14,487	11,566	37,738	3,787	707	:	575
2	40,156	19,575	13,435	10,790	30,032	3,038	717	:	610
22	37,452	18,248	12,440	10,050	34,107	3,400 0,000 0,000	723	:	2000
25	34,943	00001	11,570	9,341	32,020	3,300	734	:	600
4 6	32,503	15,820	10,752	0,075 0,075	29,705	3,270	741	:	7.20
0.0	30,302	14,731	966	0,00,0	27,550	2 112	250	•	22,
9 5	20,105	13,070	9,203	7,473	23,270	5,145	25.	:	4 62
2 6	20,279	12,093	0,034	0,931	23,001	3,003	2,4	:	282
8 6	24,510	11,030	166'2	0,420	20,001	3,02,0	783	:	20%
2 8	22,799	11,052	7,309	2,900	16,061	3.033	200		808
2	10.842	76767	4,00,0	5.148	15,267	3.00.5	8118		810
32	18.442	0000	5,071	4,781	13,604	3,000	823	:	815
8	17.218	8,374	5,562	4,449	12,302	3,150	841	:	818
34	611,91	7,853	5,127	4,136	11,084	3,176	865	:	820
35	15,011	7,341	4.779	3,839	10,065	3,199	894 408	:	821
36	13,981	6,832	4,431	3,572	9,102	3,201	923	:	920
37	13,011	6,339	4,100	3,319	8,370	3,102 8 8 8	920	:	0 00 00
3	12,001	0000	3,000	ر ا ا ا ا ا ا ا ا ا ا ا ا ا ا ا ا ا ا ا	200,7	2,163	200	:	2.0
5 9	70 22	280	3,364	2,626	6.444	3,124	1,062		817
41	2/26-	4,705	3,020	2,442	8,908	3,087	1,104	:	814
42	:	· :	2,791	2,252	5,415	3,036	1,145	:	813
£4	:	:	:	2,067	4,951	2,986	1,189	:	811
‡	:	:	:	1,893	4,539	2,923	1,231	:	010
45	:	:	:	1,727	4,143	2,801	1,274	:	000
9	:	:	:	1,569	3,777	2,799	1,315	80	803
47	:	:	:	1,421	3,434	2,719	1,349	107	000
8	:	:	:	1,270	3,104	2,050	1,370	60.00	200
6	:	:	:	1,140	2,001	2,575	1,401	770	\$ 6
8:	:	:	:	000,1 000,0	2,500	2,400	284.	707	20,6
7.5	:	:	:	000	2,233	2,590	25.7	226	~ %
7 6	:	:		2/9	1,732	2,106	1,603	2/2	787
3	:				2				

TABLE 109—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

City of New York Employees' Retirement Fund-Laborers

			WITHDRAWALS				SEPARATIONS BY DISABILITY	N DISABILITY	,
		DISKIBSALS	BSALS	-	TOTAL ULTREATE	DEATES	WITHOUT PENSION	WITH PRINGION	SALARY SCALE
AGE	(a)	$a_{oldsymbol{w}[\mathbf{z}\cdot\mathbf{l}]+1}^{oldsymbol{a}}$	⁶ w ^(a) [z-2]+2	(e) an p	(e) sh	$d_{[x]}^{(a)}$ $d_{[x]}^{(a)}$ $d_{[x-1]+1}$ $d_{[x-2]+3}^{(a)}$	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(e) do	\$\frac{s}{s}\$ \$\frac{s}{s-1}+1\$ \$\frac{s}{s-2}+2\$
25	:	:		563	1,505	2,002	1,659	443	786
55	:	:	:	473	1,294	1,985	1,672	4 80	784
56	:	:	:	393	1,106	1,866	1,624	\$19	783
57	:	:	:	325	17	1,749	1,505	543	782
82	:	:	:	Ž92	797	1,638	1,474	8,	781
80	:	:	:	216	299	1,527	1,367	\$8¢	2 <u>8</u>
8	:	:	:	175	555	1,421	1,252	607	780
19	:	:	:	171	454	1,320	1,133	627	8
62	. :		•	112	300	1.221	010.1	579	780
	•		•	8	o co	200	888	9	770
3 3	:	:	:	3 3	3 (9111		V. (1)	A
5 :	:	:	:	8	200	1,040	2//	7 /9	
2	:	:	:	တ္သ	155	957	053	600	775
8	:	:	:	37	IIO	\$	525	<u>\$</u>	773
67	:	:	:	3 9	92	819	398	718	1/1
8	:	:	:	21	20	759	277	730	770
. 9	:	:	:	71	50	78 80	186	746	769
20				0	17	999	132	756	768
71		,			· v	610	00	770	765
7.2		•		•	, "	1 2	2.0	77.4	762
7.5	:	:	•	2	2 (× ×	20.	200
77	:	:	:	•	•) **	12.0	2,4
	:	:	:	:	:	3 4	2		2 1
01	:	:	:	:	:	604	25	2	25
2	:	:	:	:	:	434	17	747	752
77	:	:	:	:	:	393	21	712	750
78	:	:	:	:	:	351	×0	oss	747
20	:	:	:	:	:	300	4	585	741
8	:	:	:	:	:	265	*	495	730
81	:	:	•	:	:	220	H	401	728
83	:				:	172	:	310	719
2				•		133		234	70.0
3 2	:	:	:	:	:	30	:	t a	2
5 3	:	:	:	:	:	3 °	:	000	
25	:	:	:	:	:	SS	:	101	6/0
98	:	:	:	:	:	32	:	So	000
24		:	:	:	:	1	:	25	0
	:		:	:	:	*	:	~	010
9	•	:				•		•	

TABLE 110-SELECT ACTIVE SERVICE TABLE AND SALARY SCALE City of New York Employees' Retirement Fund-Mechanics

						WITHD	Withdrawals		ß
•		3	LIVING			Resignations	ations		. 1
AGE	(a) 1	h(=) (==1)+1	E+1E-4]1) (a) § (b) £	(a) rw[s]	**************************************	5+[5-x]43.	rw (6)	1
16	1,000,000		:		79,000	:	:	:	
18	984,138	901,783 875,265	812.666	: :	89,852	52,213	30.380	: :	
2	921,617	843,452	800,556	778,214	98,428	61,656	42,830	22,257	
83	872,005	804,978	765,587	743,202	97,665	63,190	45,093	24,749	
7.7	\$17,495	750,880	720,044	700,421	000,400	02,443	45,813	28,398	
ឌ	711,016	656,654	631,087	621,136	86,782	58,114	43,024	36,274	
2 5	663,318	192,609	584,835	275,066	82,251	55,427	41,816	34,447	
5	618,502	566,201	541,336	531,597	77,746	52,374	39,193	31,896	
27	579,530	520,360	501,301	491,300	73,427	49,210	30,300	25,064	
: 8	514,661	461,727	434,100	422,639	64,950	43,172	29,866	20,794	
2	486,738	435,623	407,398	395,104	60,745	40,034	36,766	16,871	
30	460,342	411,699	384,570	371,868	55,839	36,600	23,843	13,499	
32	435,050	309,973	304,170	352,274	51,010	33,343	21,013	10,016	
33	391,497	351,048	328,632	319,230	42,047	27,206	16,136	8,939	
34	371,669	333,628	312,920	304,695	37,947	24,321	14.176	8,105	
	353,070	317,250	208,300	291,100	34,001	21,668	12,529	7,424	
3.0	330,015	301,007	271.607	270,205	39,070	19,200	11,000	0,017	
80	304,614	273,550	250,285	254,460	24,734	15,100	8,842	5,827	
39	289,424	260,704	247,617	243,332	22,054	13,478	2,998	5,426	
\$	275,358	248,199	236,499	232,640	19,881	11,963	7,284	5,048	
4.	:	230,525	225,759	222,307	:	100,001	0,500	4,714	
7 ?	:	:	215,000	212,470	:	:	STO'O	4,350	
3 4	:	:	:	202,000	:	:	:	4,030	
4	:	:	:	1000 1000 1000 1000 1000 1000 1000 100	:	:	:	5,710	
4	:	:	:	176.256	:	:	:	5,5 / y	
47	: :	• :	: :	167,746	•	•	:	2,627	
.			: :	150,621				2,007	
\$::	:	:	151,998	:	:	: :	1,684	
20	:	:	:	144,805		:	:	1,115	
51	:	:	:	138,229	:	:	:	633	
22	:	•	:	132,291	:	:	:	419	
3	-			120,551		*		107	ı

TABLE 110-SELECT ACTIVE SERVICE TABLE AND SALARY SCALE-Continued

City of New York Employees' Retirement Fund-Mechanics

						WITHDRAWALS	NAMALS	
		Living	ואט			Resignations	stions	
Y _G	(e) (E)	f(5) f(5-1)+1) (a) h(3-2)+2) (e)	rep _[3]	rw[s-1]+1	rw _[3-2] +2	, w (6)
54		:		120,885	:	:	:	198
55	:	:	:	115,229	:	:	:	130
26	:	:	:	109,565	:	:	:	9
27	:	:	:	103,904	:	:	:	19
88	:	:	:	98,221	:	:	:	\$
20	:	:	:	92,547	:	:	:	31
8	:	:	:	86,945	:	:	:	23
19	:	:	:	81,403	:	:	:	15
20	:	:	:	75,975	:	:	:	2
2:	:	:	:	20,008	:	:	:	0
z :	:	:	:	05,524	:	:	:	ca ·
65	:	:	:	00,513	:	:	:	H
8	:	:	:	55,054	:	:	:	:
20	:	:	:	50,939	:	:	:	:
2	:	:	:	40,380	:	:	:	:
2	:	:	:	41,955	:	:	:	:
21	:	:	:	37,008	:	:	:	:
7.5	:	:	:	33,517	:	:	:	:
2 2	:	:	:	29,444	:	:	:	:
21	:	:	:	25,443	:	:	:	:
* :	:	:	:	21,540	:	:	:	:
0.5	:	:	:	17,000	:	:	:	:
9 8	:	:	:	14,000	:	:	:	:
<u> </u>	:	:	:	10,307	:	:	:	:
20	:	:	:	7,138	:	:	:	:
2	:	:	:	4,545	:	:	:	:
80 8	:	:	:	2,579	:	:	:	:
50	:	:	:	1,293	:	:	:	:
25	:	:	:	505	:	:	:	:
3	:	:	:	500	:	:	:	:
\$:	:	:	•	S Y	:	:	:	:
20	:	:	:	2 **	•		:	:
980			:	2	•	:		

TABLE 110—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued City of New York Employees' Retirement Fund—Mechanics

			WITHDRAWALS			4	SEPARATIONS BY	BY DISABILITY	Salary
-		Dismissale	sale		Total	The state of	Without	With Pension	Scale
	6. [8]	$\epsilon_{v_{[x-1]+1}}^{(a)}$	40 (3) 1+3	(a) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	(g) #1 #3	6.6. (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	7, 7, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	e (6)	5[2] 5[2-1]+1 5[2-2]+2 5 3
<u> </u>	15,500	:	:	:	:	2,759	958	:	422
_	15,352	13,346		:	:	2,705	964	:	400 83
	15,030	13,041	10.067	0.108	21.466	2,576	9/2 180	: :	683
2	13,952	12,236	10,565	8,524	33,273	2,527	186	:	780
	13,243	11,656	10,092	7,884	36,282	2,458	896	:	805
	12,752	11,087	9,511 808 808	7,247	42,250	2,307	900		1,022
	11,807	9,939	8,363	5,963	40,410	2,162	897		1,096
	11,442	9,512	7,849	5,407	37,303	2,073	198		1,165
	11,475	9,054	7,370	4.904	33,649	0661	835	:	1,230
	11,330	\$7.00 \$0.00	0000	4.450	29,522	1,924	100		1,340
	11,682	8,407	6,152	3,753	20,624	1,861	751	::	1,387
	11,923	8,316	5,846	3,488	16,987	1,867	740	:	1,428
	001,21	0,207	5,572	3,200	14,003	1,095	729		1.405
	13,115	8,215	5,004	2, 8 8, 8 0, 8	11,828	1,095	713	: :	1,523
	13,715	8,241	4,881	2,727	10,832	2,050	707	:	1,543
	14,370	8,185	4,683	2,585	10,000	2,125	101	:	1,559
	15,121	9,000	4,400	2,449	9,200	2,207	2,5	•	1,572
	16,084	7,741	4,010	2,200	8,036	3,380	712	::	1,592
	16,005	7,561	3,813	2,100	7,526	2,454	712	:	1,598
	15,723	7,248	3,619	966'1	7,044	2,513	216	:	1,601
	:	0,954	3,432	1,895	609'9 -	2,562	718	:	1,002
	:	:	3,250	1,793	0,149	2,013	727	:	1,00
	:	:	:	060,1	5,729	2,000	739	:	1,00
	:	:	:	1,001	25.5	2,095	25.		1,606
	:	:	:	1,301	4,413	2,700	7.29	264	1,607
	: :	: :		1,267	3,804	2,810	783	637	1,607
	:	•	:	1,132	3,229	2,865	795	734	1,608
	:	:	:	946	2,660	2,918	8	908	1,608
	:	:	:	191	1,882	2,984	827	883	1,007
	:	:	:	4	1,075	3,000	\$ 00 4 00 4 00 4 00 4 00 4 00 4 00 4 00	940	1,007
	::	:	:	270	260	3,142	**************************************	610'1	700

TABLE 110—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

City of New York Employees' Retirement Fund-Mechanics

WITEDRAWALS	ı	
	Dismissals	Dismissals
(a) (b) (c) (c)		$d_{W[s-1]+1}$ $d_{W[s-2]+2}$
:		
:	:	:
:	:	:
:	:	:
:	:	:
:	:	:
:	:	:
:	_	:
:	:	:
:	:	:
:	_	:
:		
	•	
: :		
:	:	:
:	:	:
:	:	:
:	:	:
:	:	:
:	_	:
:	:	:
:	•	:
:	:	:
:	•	:
:	_	:
:		:
:	_	:
:	_	_
:	_	_
:	:	:
: :		
. :	_	

TABLE—PENSIONERS' MORTALITY TABLE

City of New York Employees' Retirement Fund-Clerks

Table employed was same as that used for pensioners of Supreme Court, First Department, Pension Fund. See Table 155, page 287.

TABLE 111—PENSIONERS' MORTALITY *TABLE
City of New York Employees' Retirement Fund—Laborers

Age	Living Į(p) z	Dying d ^(p)	Age	Living $l_{x}^{(\hat{p})}$	Dying $d_{z}^{(\dot{p})}$
20	92,637	723	61	56,371	1,628
21	Q1,Q14	722	62	54,743	1,713
22	91,192	721	63	53,030	1,800
23	90,471	720	64	51,230	1,880
24	89,751	710	65	49,341	1,080
25	89,032	718	66	47,361	2,070
26	88,314	718	67	45,291	2,158
27	87,596	718	68	43,133	2,243
28	86,878	718	69	40,890	2,321
29	86,160	710	70	38,560	2,391
30	85,441	720	71	36,178	2,448
31	84,721	721	72	33,730	2,487
32	84,000	723	73	31,243	2,505
33	83,277	726	74	28,738	2,501
34	82,551	729	75	26,237	2,476
35	81,822	732	76	23,761	2,431
36	81,000	737	1 77	21,330	2,369
37	80,353	742	78	18,961	2,291
38	79,611	749	79	16,670	2,196
39	78,862	756	80	14,474	2,091
40	78,106	765	81	12,383	1,964
41	77,341	774	82	10,419	1,816
42	76,567	785	83	8,603	1,648
43	75,782	797	84	6,955	1,470
44	74,985	812	85	5,485	1,292
45	74,173	828	86	4,193	1,114
46	73,345	848	87	3,079	933
47	72,497	870	88	2,146	744
48	71,627	896	89	1,402	555
49	70,731	927	90	847	385
50	69,804	962	91	462	246
51	68,842	1,001	92	216	137
52	67,841	1,044	93	79	58
53	66,797	1,091	94	21	18
54	65,706	1,143	95	3	3
55	64,563	1,199	96		• • • •
56	63,364	1,260	97		• • • •
57	62,104	1,325	98		• • • •
58	60,779	1,394	99		• • • •
59	59,385	1,468	100	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
60	57,917	1,546	1		

^{*}American Experience Table

TABLE	112—PENSIONERS'	MORTALITY	TABLE

City of New York Employees' Retirement Fund-	-Mechanic	8
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Age	Living $l_{z}^{(\hat{p})}$	Dying $d_{z}^{(\hat{p})}$	Age	Living $l_{z}^{(\hat{p})}$	Dying $d_{z}^{(\hat{p})}$
45	100,000	1,130	74	39,344	3,238
46	98,870	1,167	75	36,106	3,224
47	97,703	1,212	76	32,882	3,200
48	96,491	1,274	77	29,673	3,145
49	95,217	1,314	78	26,528	3,040
50	93,903	1,362	79	23,488	2,908
51	92,541	1,416	80	20,580	2,754
52	01,125	1,476	81	17,826	2,595
53	89,649	1,542	82	15,231	2,414
54	88,107	1,586	83	12,817	2,208
55	86,521	1,670	84	10,609	1,998
56	84,842	1,748	85	8,611	1,774
57	83,094	1,828	86	6,837	1,538
58	81,266	1,926	87	5,299	1,293
59	79,340	2,007	88	4,006	1,058
60	77,333	2,103	89	2,948	852
61	75,230	2,204	90	2,096	662
62	73,026	2,203	91	1,434	493
63	70,733	2,391	92	941	351
64	68,342	2,501	93	590	238
65	65,841	2,614	94	352	155
66	63,227	2,706	95	197	94
67	60,521	2,796	96	103	54
68	57,725	2,875	97	49	28
69	54,850	2,962	98	21	12
70	51,888	3,025	99	9	6
71	48,863	3,117	100	3	2
72	45,746	3,184	101	I	1
73	1, 42,562	3,218	II I		

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table, based on an assumed entrance salary of \$1,000, shows for each of the three divisions of the City of New York Employees' Retirement Fund the present value of the total salary to be earned during active service and the present value of the pension that may be paid as described in the enumeration of benefits on page 179. Due allowances have been made, of course, for increases in salary and for the fact that the benefit is based on final salary.

TABLE 113—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUE OF THE PENSION BENEFIT, PAYABLE TO THESE MEMBERS, BASED ON AN ENTRANCE SALARY OF \$1,000.

City of New York Employees' Retirement Fund

	Cu	ERKS	Мво	CHANICS	LAE	ORERS
AGE AT ENTRANCE	Future Salary	Pension Upon Service Retirement	Future Salary	Pension Upon Service Retirement	Future Sal a ry	Pension Upon Service Retirement
20	\$15,456	\$98	\$13,807	\$106	\$10,160	\$26
25	9,491	ĺ Šī ĺ	11,111	111	8,542	32
30	8,697	101	10,093	126	8,005	42
35	8,757	129	9,651	142	7,748	53
40 i	8,970	154	9,535	153	7,666	63

The following table shows the expectations of life of pensioners of each of the three divisions of the City of New York Employees' Retirement Fund, together with the annuity values based on the mortality tables, which were used in valuing pensions:

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TABLE 114-ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO PENSIONERS

City of New York Employees' Retirement Fund

	CF	CLERES	LABO	ORKES	MECHANICS	ANICS		CF	CLERKS	LAB	LABORERS	MECH	MECHANICS
AGE	Annuity	Expectation of Life	Annuity Value	Expectation of Life	Annuity Value	Expectation of Life	AGE	Annuity	Expectation of Life	Annuity Value	Expectation of Life	Annuity Value	Expectation of Life
45	14.65	24.56	14.75	24.54	14.73	24.63	73	6.34	7.81	5.88	7.11	6.14	7.52
46	14.40	23.87	14.48	23.81	14.45	24.18	74	6 .0	7.38	5.59	89.9	5.85	60.7
47	14.15	23.17	14.21	23.08	14.20	23.19	75	2.76	6.97	5.29	6.27	5.56	89.9
4	13.89	22.48	13.94	22.36	13.93	22.47	92	5.48	6.57	5.01	5.88	5.28	6.39
49	13.62	21.80	13.65	21.63	13.65	21.77	11	5.20	6.19	4.72	5.49	S.01	5.91
20	13.35	21.11	13.36	16.02	13.37	21.06	78	4.94	5.82	4 . 44	5.11	4.75	5.55
51	13.07	20.44	13.06	20.20	13.08	20.37	79	4.68	5.47	.4.16	4.74	4.49	5.21
52	12.79	19.76	12.75	19.49	12.79	19.61	8	4.43	5.13	3.88	4.39	4 . 24	4.87
23	12.50	19.10	12.44	18.79	12.49	18.99	81	4.18	4.81	3.61	4.05	3.99	4.55
54	12.21	18.44	12.13	18.09	12.19	18.31	87	3.95	4.50	3.34	3.71	3.74	4.24
55	16.11	17.79	18.11	17.40	11.88	17.64	x	3.72	4.21	3.08	3.39	3.51	3.94
26	11.62	17.14	11.48	16.72	11.57	16.98	2	3.50	3.8	2.83	3.08	3.28	3.66
27	11.31	16.50	11.15	16.05	11.25	16.33	82	3.29	3.68	2.56	2.77	3.06	3 · 39
28	10.11	15.88	10.82	15.39	10.93	15.68	8	3.00	3.43	2.30	2.47	2.85	3.14
20	10.70	15.26	10.49	14.74	19.01	15.05	87	8.8	3.19	2.05	2.18	2.66	2.91
8	10.38	14.65	10.15	14.10	10.29	14.43	88	2.71	2.97	1.81	16.1	2.47	2.68
61	10.01	14.05	18.6	13.47	6.64	13.82	8	2.54	2.77	1.58	1.66	2.29	2.47
62	9.75	13.46	9.47	12.86	9.64	13.22	8	2.37	2.57	1.37	1.42	2.11	2.27
8	9.44	12.88	9.13	12.26	9.32	12.63	16	2.22	2.39	:	:	1.95	2.08
\$	9.12	12.31	8.79	11.67	8.	12.00	92	2.07	2.22	:	:	 8:	16.1
65	& •	11.76	8.45	11.10	8.67	11.50	8 8	1.93	2.00	:	:	1.66	I.75
99	8.49	11.22	8.12	10.54	8.34	10.95	\$	8. 8.	16.1	:	:	1.51	1.59
67	8.17	10.69	7.78	8.01	8.02	10.42	92	1.67	1.77	:	:	1.38	I . 44
89	7.86	10.17	7.45	9.47	7:70	06.6	96	1.50	1.64	:	:	1.26	1.31
69	7.55	6.67	7.13	8.97	7.38	9.39	97	1.45	1.52	:	:	1.16	61.1
20	7.24	9.18	6.81	8.48	7.07	8.8	86	1.35	1.41	:	:	1.10	1.12
71	6.93	8.71	6.40	8. 8.	6.75	8.42	S	1.25	1.30	:	:	92	4
22	6.63	8.25	6.18	7.55	6.44	2.96	8	1.17	1.21	:	:	.83	.83
		_							-				

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ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of clerks, administrative officers and technical employees among members of the City of New York Employees' Retirement Fund in active service as of June 30, 1914, exclusive of clerks among exempt, appointed and elected employees:

TABLE 115—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS, SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

City of New	York Employees'	Retirement	Fund—Clerks
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AGE	М	en	Wo	MBX	Total Number at	Total Salaries at
	Number	Salaries	Number	Salaries	Indicated Age or Above	Indicated Age or Above
15	8	\$2,400	1	\$600	12,277	\$15,180,970
16	81	27,240		• • •	12,268	15,177,970
17	94	30,520		• • • •	12,187	15,150,730
18	108	38,880	3	1,140	12,093	15,120,210
19	99	47,920	13	6,840	11,982	15,080,190
20	163	95,490	37	23,260	11,870	15,025,430
21	208	135,310	40	24,900	11,670	14,906,680
22	255	196,970	47	32,070	11,422	14,746,470
23	285	245,430	55	39,070	11,120	14,517,430
24	242	235,440	68	50,290	10,780	14,232,930
25	233	246,810	122	97,850	10,470	13,947,200
26	241	264,900	147	114,090	10,115	13,602,540
27	316	362,780	102	85,420	9,727	13,223,550
28	337	408,820	133	109,830	9,309	12,775,350
29	276	343,940	126	106,490	8,839	12,256,700
30	299	387,100	145	127,470	8,437	11,806,270
31	340	460,440	103	95,340	7,993	11,291,700
32	312	420,030	110	101,970	7,550	10,735,920
33	279	393,990	109	98,870	7,128	10,213,920
34	314	422,020	118	112,210	6,740	9,721,060
35	294	417,340	100	97,960	6,308	9,186,830
36	242	340,850	8 6	82,370	5,914	8,671,530
37	262	385,040	72	68,360	5,586	8,248,310
38	237	348,800	91	87,100	5,252	7,794,910
39	223	331,820	76	69,740	4,924	7,359,010
40	274	421,280	73	66,060	4,625	6,957,450
41	200	305,630	53	49,630	4,278	6,470,110
42	236	377,960	59	52,120	4,025	6,114,850
43	179	278,050	47	43,950	3,730	5,684,770
44	208	342,970	53	48,260	3,504	5,362,770
45	168	283,350	42	37,610	3,243	4,971,540
46	192	304,940	39	34,900	3,033	4,650,580
47	172	282,940	29	25,550	2,802	4,310,740
48	180	293,380	29	26,960	2,601	4,002,250
49	152	231,190	35	32,780	2,392	3,681,910
50	153	250,600	33	25,150	2,205	3,417,940
51	148	242,570	16	13,130	2,010	3,142,190
52	149	235,540	15	14,320	1,855	2,886,490
53	105	163,010	11	10,440	1,691	2,636,630
54	134	218,950	15	12,480	1,575	2,463,180
55	116	189,830	17	14,310	1,426	2,231,750
56	113	188,940	15	12,730	1,293	2,027,610
57	94	150,910	9	7,820	1,165	1,825,940
58	100	175,340	5	3,820	1,062	1,667,210
59	85	128,020	5	4,050	951	1,488,050
60	76	125,340	3	3,150	861	1,355,980

TABLE 115—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS, SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE—Continued

City of New York Employees' Retirement Fund-Clerks

AGE	M	ien	Wo	Men	Total Number at	Total Salaries at
	Number	Salaries	Number	Salaries	Indicated Age or Above	Indicated Age or Above
61	87	\$144,430		• • •	782	\$1,227,490
62	54	83,800	3	\$2,700	695	1,083,060
63	49	79,370	3	2,500	638	996,560
64	63	92,740	3	5,060	586	914,690
65	53	87,100	I	750	520	816,890
66	50	87,570	3	2,200	466	729,040
67	40	62,860	2	1,320	413	639,270
68	58	85,320	2	1,300	371	575,000
69	36	55,750	2	1,260	311	488,470
70	51	80,120	I	720	273	431,460
71	46	80,440		• • • •	221	350,620
72	41	64,850	1	600	175	270,180
73	19	28,580	1	600	133	204,730
74	20	45,750	2	2,400	113	175,550
75	25	44,610			82	127,400
76	12	18,040	••	• • • •	57	82,790
77	15	23,640			45	64,750
78	11	15,120		• • • •	30	41,110
79	5	6,950	I	720	19	25,990
80	4	6,160			13	18,320
81	I	1,200	• •		وا	12,160
82	2	2,850			9 8 6	10,960
83	2	2,310			6	8,110
84	1	1			4	5,800
85	2	2,500	••	l	4	5,800
86		1			2	3,300
87	1	1			2	3,300
88	1	1		l	2	3,300
89	2	3,300			2	3,300

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TABLE 116—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDI-TIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

City of New York Employees' Retirement Fund-Clerks

TOTAL SERVICE		(EN	Wo	MEEN	Total Number of Employees	Total Salaries of Employees
YEARS	Number	Salaries	Number	Salaries	Having Indicated Service or More	Having Indicated Service or More
0	1,334	\$1,308,110	455	\$333,540	12,277	\$15,180,970
1	1,213	1,309,240	361	286,920	10,488	13,539,320
2 3 4	919	1,025,550	372	301,210	8,914	11,043,160
3	720	826,230	233	190,790	7,623	10,616,400
4	667	869,010	181	156,750	6,670	9,599,380
5	407	516,380	136	124,050	5,822	8,573,620
5 6 7 8	552	780,820	109	97,480	5,279	7,933,190
7	546	778,760	110	117,180	4,618	7,054,890
8	516	751,000	141	140,510	3,953	6,158,950
9	334	473,990	59	50,860	3,296	5,267,440
10	194	312,490	55	50,820	2,903	4,742,590
11	240	353,430	76	78,640	2,654	4,379,280
12	409	663,710	66	76,120	2,338	3,947,210
13	87	146,350	14	15,010	1,863	3,207,380
14	150	250,590	27	31,450	1,762	3,046,020
15	210	344,750	15	16,890	1,585	2,763,980
16	424	783,760	47	50,920	1,360	2,402,340
17	98	163,030	14	14,960	889	1,567,660
18	136	232,010	13	16,140	777	1,389,670
19	135	236,920	5	6,450	628	1,141,520
20	60	103,150	5	4,540	488	898,150
21	44	93,000	3	3,410	423	790,460
22	43	73,630	4	4,650	376	694,050
23	48	84,690	2	2,400	329	615,770
24	46	78,770	2	1,320	279	528,680
25	31	67,830	5	6,000	231	448,590
26	27	56,650	2	2,850	195	374,760
27	30	51,900	3	2,820	166	315,260
28	20	44,000	2	3,300	133	260,540
29	22	45,580	3	1,800	111	213,240
30 and over	83	161,050	3	4,810	86	165,860

The following tables show the number of laborers among members of the City of New York Employees' Retirement Fund in active service as of June 30, 1914, exclusive of laborers among exempt employees:

TABLE 117—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

City of New York Employees' Retirement Fund-Laborers

AGE	м	en	Wo	men	Total Number at	Total Salaries at
	Number	Salaries	Number	Salaries	Indicated Age or Above	Indicated Age or Above
16	2	\$600	8	\$1,700	12,015	\$8,896,680
17	4	1,320	22	5,020	12,005	8,894,380
18 19	3 8	1,380	37	9,000	11,979	8,888,040
20	t .	3,570	31	7,320	11,939	8,877,660
21	14	6,920 5,660	35 21	8,900 6,080	11,900	8,866,770 8,850,950
22	31	19,220	23	7,060	11,820	8,839,210
23	38	24,510	15	4,520	11,766	8,812,930
24	63	42,240	20	5,460	11,713	8,783,900
25	82	53,950	19	5,480	11,630	8,736,200
26	155	106,700	17	5,080	11,529	8,676,770
27	112	80,480	15	5,160	11,357	8,564,990
28 29	192	143,990	18	6,550	11,230	8,479,350
30	175	131,120	15 16	4,580	11,020	8,328,810
31	217	162,430	14	5,240 4,340	10,830	8,193,110 8,025,440
32	235	184,660	22	8,300	10,377	7,860,070
33	211	167,020	16	6,690	10,120	7,667,110
34	289	231,870	15	6,550	9,893	7,493,400
35	241	194,920	18	6,240	9,589	7,254,980
36	286	224,220	29	11,200	9,330	7,053,820
37	248	192,400	12	5,380	9,015	6,818,400
38 39	321 282	253,770	30	12,510	8,755	6,620,620
40	202	233,900 237,880	26	10,000	8,404 8,096	6,354,340
41	304	242,110	34 25	9,590	7,763	6,110,350 5,859,390
42	328	273,030	33	14,880	7,434	5,607,690
43	237	187,140	31	11,670	7,073	5,319,780
44	289	236,530	43	18,150	6,805	5,120,970
45	310	249,590	41	17,570	6,473	4,866,290
46 47	307	239,340	3 3	15,100	6,122	4,599,130
48	295	238,160	40	17,570	5,782	4,344,690
49	315 259	247,520 201,000	33 40	13,420 17,120	5,447 5,099	4,088,960 3,828,020
50	317	247,730	46	17,900	4,800	3,609,900
51	260	211,910	20	8,860	4,437	3,344,270
52	264	205,610	28	11,220	4,157	3,123,500
53	259	205,900	29	11,610	3,865	2,906,670
54	286	219,930	28	12,640	3,577	2,689,160
55 56	300	238,250	29	11,490	3,263	2,456,590
57	238 187	180,540	22 11	8,820	2,934	2,206,850
58	259	147,900	18	4,910 7,220	2,674 2,476	2,017,490 1,864,680
59	207	154,490	12	5,520	2,199	1,657,430
60	192	149,950	21	9,620	1,980	1,497,420
61	151	114,680	10	5,130	1,767	1,337,850
62	176	132,090	10	4,590	1,606	1,218,040
63 64	102	80,440	4	2,090	1,420	1,081,360
65	151	120,720	6 6	3,270	1,314	998,830 874,840
66	124	99,220 102,680	6	3,490 2,200	1,157	772,130
67	112	91,080	4	2,160	886	667,250
68	113	82,910	ī	280	770	574,010
69	93	68,650	5	1,840	656	490,820
70	130	105,140		•	558	420,330
71	74	56,200	••		428	315,190
72 73	76	56,960	I	360	354	258,990
73 74	65	31,140	3 2	1,250 1,600	277	201,670 169,280
7 5	43	48,160 31,240	1	360	230 163	119,520
7 6	25	19,410	Ī	480	119	87,920
77	29	22,640	<u></u>		93	68,630

SECTION II 236

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1,052

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138 85

353,500 497,700

241,380

242,400

150,570

TABLE 120-NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE. WITH ADDI-TIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More		Total Service Years	Number		Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	500	\$644,330	6,064	\$9,059,650	16	305	\$459,450	820	\$1,309,640
1	630	773,310	5,555	8,415,320	17	70	109,320	524	850,190
2	461	584,760	4,925	7,642,010	18	62	112,440	454	740,870
3	317	426,830	4,464	7,057,250	19	59	89,500	392	628,430
4	471	658,990	4,147	6,630,420	20	43	65,680	333	538,930
5	288	441,290	3,676	5,971,430	21	26	39,470	290	473,250
6	271	389,450	3,388	5,530,140	22	43	65,360	264	433,780
7	470	730,040	3,117	5,140,690	23	20	34,050	221	368,420
8	446	732,080	2,647	4,410,650	24	29	45,840	201	334,370
9	314	508,000	2,201	3,678,570	25	47	73,630	172	288,530
10	223	375,380	1,887	3,170,570	26	19	26,940	125	214,900
11	219	353,500	1,664	2,795,190	27	13	19,750	106	187,960
		1	1	1	11 00				1 /0

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29,590

116,280

93 80

65

168,210

145,870

116,280

2,441,600

1,943,990

1,702,610

1,460,210

City of New York Employees' Retirement Fund-Mechanics

The following tables show the number of exempt, elected and appointed employees in active service as of June 30, 1914:

TABLE 121—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

City of New York Employees' Retirement Fund-Exempt, Elected and Appointed **Employees**

AGE	Exe	MPT	ELECTED AN	D APPOINTED	Total Number at	Total Salaries at	
	Number	Salaries	Number	Salaries	Indicated Age or Above	Indicated Ago or Above	
15	2	\$540			2,832	\$7,196,130	
16	12	3,390			2,830	7,195,590	
17	12	3,410			2,818	7,192,200	
18	17	6,620			2,806	7,188,790	
19	23	10,170			2,789	7,182,170	
20	42	22,610			2,766	7,172,000	
21	40	23,000			2,724	7,149,390	
22		39,680			2,684	7,126,390	
23	59 67	50,830	I	\$1,500	2,625	7,086,710	
24	56	43,160			2,557	7,034,380	
25	65	55,070			2,501	6,991,220	
26	93	88,210			2,436	6,936,150	
27	67	68,650	2	20,500	2,343	6,847,940	
28	65	76,030	2	26,500	2,274	6,758,790	

TABLE 121—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE—Continued

City of New York Employees' Retirement Fund—Exempt, Elected and Appointed Employees

			Employe			
Age	Exa	MPT Salaries	ELECTED AND	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
	Number		Number	- Salaries	Of Above	- Of Above
29	62	\$75,590	2	\$24,500	2,207	\$6,655,360
30	67	108,520	6	57,500	2,143	6,555,270
31	80	146,220	I	7,000	2,070	6,389,250
32	65	89,790	8	57,000	1,989	6,236,030
38	61	96,910	11	113,500	1,916	6,089,240
34	70	130,590	14	110,500	1,844	5,878,830
35 36	72	142,700	13	95,000	1,760	5,637,740
37	75	143,140	15	130,500	1,675 1,585	5,400,040 5,126,400
38	52 80	181,830	15	114,500	1,513	4,893,830
39		130,030	-3	66,200	1,418	4,597,500
40	53 78	177,300	15	97,600	1,356	4,401,270
41	78	100,660	12	127,000	1,263	4,126,370
42	66	117,940	15	143,000	1,173	3,808,710
43	55	141,970	11	96,900	1,002	3,547,770
44	76	170,680	15	123,300	1,026	3,308,900
45	Óε	130,440	12	79,800	935	3,014,920
46	72	148,270	19	147,500	862	2,804,680
47	53	121,430	12	102,000	771	2,508,910
48	52	126,090	12	82,500	706	2,285,480
49	41	87,050	11	116,500	642	2,076,890
50	45	93,920	4	32,000	590	1,873,340
51	39	88,200	8	59,500	541	1,747,420
52	40	101,560	5	52,500	494	1,599,720
58	37	122,170	7	64,500	449	1,445,660
54	56	116,460	11	74,800	405	1,258,990
55 56	37	82,860	6	56,500	338	1,067,730
57	23	68,080	5 7	46,000	295 267	928,370
58	33 15	48,120	3	30,500	227	814,290 689,630
59	26	58,440	3	23,500	200	611,010
60	16	38,680	1	4,000	179	529,070
61	13	33,210	2	11,000	162	486,390
62	15	30,030	ī	0,000	147	442,180
63	111	33,360		l	131	403,150
64	15	26,200	4	33,000	120	369,790
65	ıŏ	25,380	3	26,000	101	310,500
66	14	36,640	3	21,000	82	259,120
67	9	26,110			65	201,480
68	4	24,780	2	24,500	56	175,370
60	13	44,240	I	3,000	50	126,090
70	7 6	21,580	• • •	• • • •	36	78,850
71 72	l .	8,950		• • • •	29	57,270
72 73	3	4,930	· ·		23	48,320
74 74	3 6	4,200	l î	10,000	20 16	43,390
75	1 1	9,100		10,000		35,190 16,090
76		3,750	::	:::	9 8	14,290
77	3	7,300	::		6	10,540
78		/,350	1 ::	1 :::	3	3,240
79	ı z	540	1	l	3	3,240
80	l			1	2	2,700
81	1	2,250			2	2,700
82					1	450
83	1	450			1	450
	l	1	1	<u> </u>	<u> </u>	1

TABLE 122—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDI-TIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

City of New York Employees' Retirement Fund—Exempt, Elected and Appointed Employees

TOTAL SERVICE	Ex	EMPT	ELECTED AN	D APPOINTED	Total Number of Employees	Total Salaries of Employees	
YEARS	Number	Salaries	Number	Salaries	Having Indicated Service or More	Having Indicated Service or More	
0	388	\$797,980	99	\$620,400	2,832	\$7,196,130	
1	302	361,400	25	193,300	2,345	5,777,759	
2 3 4 5	278	439,030	27	177,700	2,018	5,223,050	
3	171	275,220	20	171,500	1,713	4,606,320	
4	289	613,110	45	348,200	1,522	4,159,600	
5	88	105,830	7	72,000	1,188	3,198,290	
6	166	302,350	28	270,500	1,093	3,020,460	
7 8	113	208,480	22	272,000	899	2,447,610	
8	102	209,450	7 8	49,300	764	1,967,130	
9	89	135,320	8	91,000	655	1,708,38	
10	75	144,980	4	25,000	558	1,482,06	
11	49	69,950	5 6	58,000	479	1,312,08	
12	62	107,050		40,500	425	1,184,13	
13	53	79,490	2	29,500	357	1,036,58	
14	35	105,990	3	33,500	302	927,59	
15	38	50,060	1	7,500	264	788,10	
16	47	125,900	9	80,500	225	730,54	
17	27	47,090			169	524,14	
18	21	40,430	4	64,500	142	477,05	
19	26	55,610	2	12,000	117	372,12	
20	II	12,670	I	4,000	89	304,51	
21	13	25,860	I	10,000	77	287,84	
22	7	13,580		• • • •	63	251,98	
23	8	19,010	I	17,500	56	238,40	
24	9	24,410	I	8,000	47	201,89	
25	4	17,880			37	169,48	
26	3	12,550	I	8,000	33	151,60	
27	4	10,890	2	22,500	29	131,05	
28	3	10,940			23	97,66	
29	5	15,520			20	86,72	
0 & over	14	52,800	I	18,400	15	71,20	

TABLE 123—EXEMPT, ELECTED AND APPOINTED EMPLOYEES. CLASSIFIED BY OCCUPATION

City of New York Employees' Retirement Fund

Class	Number	Salaries
Clerks Laborers Mechanics	2,478 336 18	\$6,898,420 271,760 25,950
Total	2,832	\$7,196,130

The following table shows the number of pensioners, classified as clerks, laborers or mechanics, on the roll as of June 30, 1914:

TABLE 124—NUMBER AND PENSIONS OF ALL PENSIONERS CLASSIFIED BY AGE

City of New York Employees' Retirement Fund

AGE	CLE	RKS	LABO	RERS	MECHANICS		
	Number	Pensions	Number	Pensions	Number	Pensions	
51					ī	\$630	
52 ·			l ::				
53	1 ::	i :::	:: .	1	::	1	
54	1	1	· · ·	1	l ::		
55	1			1	1	l	
56			l ''	l	• • •		
57			• • •		••		
58	1 ":	•	·:	 •::	i :	i :::-	
59	I	\$1,170	I	\$ 390	I	740	
	2	2,470	1 .:	• • • • • • • • • • • • • • • • • • • •			
60			1	420]	
61	1	1,150				1 :::	
62	2	1,850	• • • • • • • • • • • • • • • • • • • •		I	660	
63	I	1,200			•••		
64	3	3,430			1 1	900	
65	1	1,350					
66		l	2	1,150	2	1,390	
67		1	2	910	2	1,460	
68	i	l	1 1	540	1	1,200	
69	1	1,250	6	2,800	4	3,040	
70	1 1	590	2	1,500	2	1,520	
71	3	2,230	ī	600	1 2	1,560	
72	5	4,510	2	900	ī	820	
73	3		4	2,210	3	2,100	
74		750				680	
7 4 75	5	6,150	3	1,420	! I		
75 76	• •		2	760	1	690	
	I	1,200	3	1,710	I	520	
77	2	1,570	1	450	1	900	
78	5	6,460		· · · <u>·</u>		•;•	
79	I	980	I	280	I	600	
80	2	920					
81			3	1,800			
82							
83	2	2,400			l		
84	2	1,980	1	450	l	1	
85	1	1	ı	660	l		
86	I	1,500					
Total Men	41	\$44,470	36	\$18,500	26	\$19,410	
Total Women	2	640]]	450			
Grand Total	43	\$45,110	37	\$18,950	26	\$19,410	

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets of June 30, 1914, and shows the complete financial condition of the fund

TABLE 125—A VALUATION OF ASSETS AND LIABILITIES OF VALUED AS OF

Liabilities	
· Item	Present Value of Payments to be Made
Pensions to 43 Pensioners among Clerks now on the pension roll of the	
fund as follows: 41 Men on annual pensions aggregating \$44,470	3,007
36 Men on annual pensions aggregating \$18,500	112,291
r Woman on annual pensions aggregating \$450 Pensions to 26 Pensioners among Mechanics now on the pension roll of the fund as follows:	
26 Men on annual pensions aggregating \$19,410	143,008
Total Pensions Entered Upon	\$557,406
Pensions to such Clerks as will retire from the present active force of 12,277 clerks: Men	\$4,421,891 453,166
12,015 laborers: Men	1,564,426
Women Pensions to such Mechanics as will retire from the present active force	79,529
of 6,064 mechanics	3.088.175
active force of 2,500 employees	1.315.711
active force of 172 employees	585.404
Pensions to such Appointed employees as will retire from the present active force of 160 employees	
Total Pensions not Entered Upon	\$11,705,346
Grand Total	-\$12,262,752

and liabilities of the City of New York Employees' Retirement Fund as as of that date:

THE CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND—JUNE 30, 1914.

Assets	
Item	Present Value of Payments to be Received
Funds in hand. Contribution by Employees. *Deficiency.	\$12,262,752
Grand Total	\$12,262,752

^{*}Norm—The law provides that pensions may be paid out of the excise moneys, but as no definite limit is placed on the amount of the excise moneys which may be used for this purpose, no estimate of the returns from this source has been made.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll,—that is, present pensioners.

TABLE 126—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Years After Valua- tion	Date*	Pensions to Clerks	Pensions to Laborers	Pensions to Mechanics	Years After Valua- tion	Date*	Pensions to Clerks	Pensions to Laborers	Pensions to Mechanica
0	1014	\$43,100	\$18,045	\$18,776	25	1939	\$1,047	\$97	\$469
1	1015	39,457	16,400	17,596	26	1940	815	70	376
2	1916	35,927	14,816	16,408	27	1941	622	51	300
3	1917	32,557	13,294	15,220	28	1942	460	36	244
4	1918	29,416	11,853	14,037	29	1943	344	25	196
5	1010	26,406	10,495	12,867	30	1944	246	16	157
6	1020	23,597	9,228	11,720	31	1945	172	9	125
7	1921	21,001	8,054	10,603	32	1946	118	5	98
8	1022	18,610	6,974	9,525	33	1947	78	2	77
9	1923	16,414	5,987	8,492	34	1948	49	1	59
10	1024	14,413	5,003	7,514	35	1949	20		45
11	1925	12,600	4,201	6,596	36	1950	18		33
12	1026	10,966	3,567	5,742	37	1951	9	1	24
13	1927	0,502	2,930	4,953	38	1952	5		17
14	1028	8,194	2,377	4,237	39	1953	2		12
15	1929	7,032	1,894	3,592	40	1954			8
16	1930	6,004	1,489	3,018	41	1955	١	l	5
17	1931	5,099	1,148	2,513	42	1956		l	5 3
18	1932	4,306	875	2,076	43	1957	l	l	2
19	1933	3,618	655	1,700	44	1958	l		1 1
20	1934	3,015	484	1,385	45	1959		i	
21	1935	2,493	354	1,121	46	1960	l		
22	1936	2,041	256	903			1	i i	
23	1937	1,654	185	729				l———	
24	1938	1,325	133	584	Tota	al	\$382,779	\$141.180	\$184,158

^{*}Date-Year Beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the City of New York Employees' Retirement Fund, expressed as a percentage of the employee's salary.

TABLE 127—RATES OF CONTRIBUTION EXPRESSED AS PER-CENTAGES OF SALARIES NECESSARY TO PAY FOR THE PENSION BENEFIT OF THE CITY OF NEW YORK EM-PLOYEES' RETIREMENT FUND.

Age at Entrance	Clerks	Laborers	Mechanics	Age at Entrance	Clerks	Laborers	Mechanics
20	.63	. 26	.77	31	1.23	.56	1.30
21	.67	. 28	18.	32	1.29	.59	1.34
22	.71	.30	.85	33	1.35	.62	1.39
23	.75	.32	.90	34	1.41	.65	1.43
24	.80		.95	35	1.47	.68	1.47
25	.85	·35 ·38	1.00	36	1.53	.71	1.51
26	.91	.40	1.05	37	1.58	.74	1.54
27	.97	.43	1.10	38	1.63	-77	1.57
28	1.03	.46	1.15	39	1.68	.80	1.59
29	1.10	-49	1.20	40	1.72	.82	1.61
30	1.16	.53	1.25	l l			

DEPARTMENT OF STREET CLEANING RELIEF AND PENSION FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Department of Street Cleaning Relief and Pension Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

TO EMPLOYEES

- (1) Upon application after 20 years' service and attainment of 60 years of age, a pension of not less than one-half final salary. The average allowance has been about 51 per cent. of final salary.
- (2) Upon disability incurred in the actual performance of duty, a pension of \$300.
- (3) Upon disability resulting from any cause after 10 years' service, a pension of not less than one-half final salary.

The average allowance has been about 51 per cent. of final salary. Pensions to employees are for life and are not revocable if granted under provisions (1) and (3).

To widows of employees or pensioners

(4) Upon death of an employee in actual performance of duty, a pension of a discretionary amount, not to exceed \$300 per annum.

The average annuity has been about \$300.

(5) Upon death of an employee resulting from causes not connected with the performance of duty and occurring after 10 years' service, a pension of a discretionary amount, not to exceed \$200 per annum.

The average annuity has been about \$200.

(6) Upon death of a pensioned employee, a pension of a discretionary amount, not to exceed \$200 per annum.

The average annuity has been about \$200.

Pensions to widows are terminated automatically by the death or remarriage of the widow and are revocable.

To children of employees or pensioners

(7) Upon death of an employee in actual performance of duty, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$200 per annum.

The average annuity during lifetime of the youngest child has been about \$200.

- (8) Upon death of an employee resulting from any cause after 10 years' service, provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$200 per annum.
 - The average annuity during lifetime of the youngest child has been about \$200.
- (9) Upon death of a pensioned employee provided there be no widow; otherwise upon termination of widow's pension, a pension of a discretionary amount, not to exceed \$200 per annum.

The average annuity during lifetime of the youngest child has been about \$200.

Pensions to children are terminated by death, marriage or attainment of age 18.

To dependent parents of employees

(10) Upon death of an employee in actual performance of duty, a pension of a discretionary amount, not to exceed \$200 per annum to widowed mother.

The average annuity has been about \$200.

(11) Upon death of an employee from any cause after 10 years' service, a pension of a discretionary amount, not to exceed \$200 per annum to widowed mother.

The average annuity has been about \$200.

(12) Upon death of a pensioned employee,* a pension of a discretionary amount, not to exceed \$200 per annum to widowed mother. Pensions to dependent parents are terminated automatically by death or remarriage and are revocable.

Contributions

By EMPLOYEES

Three percentum of salaries.

By CITY

Indirect contributions:

Miscellaneous revenues, such as fines and deductions from employees' salaries on account of loss of time; proceeds of sales of departmental property, except real estate; proceeds of sales of incumbrances found in streets, and moneys collected for the release of such property; all moneys received for the privilege of scow trimming or assorting of refuse; all moneys received from the sale or disposal of ashes, garbage and refuse, and unexpended balances of appropriations for salaries.

Direct contributions:

None provided.

^{*}The liability for these pensions has not been computed because of remote contingency upon which they are payable.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws, it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal.

Rates of death (1) from causes arising in the actual performance of duty, and (2) from other causes

Rates of disability (1) from causes arising in the actual performance of duty, and (2) from other causes

Rate of service retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

Certain other rates applying to the family of employee which are developed fully in section III, page 305 of this report.

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The schedules used to give a basis for rates and valuation were those of the uniformed force and those of the clerical force. The clerical force, however, represents only about 2% of the total number of active employees.

Special methods of handling data

Before considering certain modifications made in the experience before it was used as a basis for exposure tables, it is perhaps advisable to present the following table which gives a summary of the cards reporting separations from the active service.

TABLE 128—SUMMARY OF THE TOTAL NUMBER OF SEPARA-TIONS FROM ACTIVE SERVICE, CLASSIFIED BY YEARS AND CAUSE OF SEPARATION, AS REPORTED

Department	of	Street	Cleaning	Relief	and	Pension	Fund
------------	----	--------	----------	--------	-----	---------	------

CAUSE OF SEPARATION	Numb	er of Sei	ARATIONS	-YEAR E	NDING JU	NE 30	TOTAL
	1909	1910	1911	1912	1913	1914	
Resignation and Dismissal Death	218 79	189 80	224 95	1,216	204 62	139 60	2,190 487
Service Retirement		::: ·		32	217 16	123 7	372 26
Total	297	269	319	1,362	499	329	3,075

The number of dismissals in 1912 was greatly in excess of the numbers occurring in other years. Investigation showed that a large number of the dismissals in 1912 were caused by a strike and that conditions in that year could not be used as indicative of future conditions, without adjustment; therefore, in preparing the rates of dismissal, a reduction was made in the rate derived directly from the experience. This reduction brought the rate

to what it would have been had the dismissals shown in the year of the strike been about the same as in a normal year.

As the pension law was not in effect prior to 1912 the experience is slightly different from what it would have been had the privilege of retirement been available throughout the entire period under observation. Consequently it was necessary, in order that rates for final use might be developed directly from the experience, to make certain adjustments in the data so that this condition might be properly taken into account. As a basis for such adjustment it was assumed that some of those who resigned or were dismissed in the three years of the experience previous to the passage of the pension law would have retired if the law had been in operation at that time.

The total separations from the service for the three age groups-20-39; 40-50; 51-65—were divided by cause and by year of separation. For each year was then computed the ratio of separations for each cause to the total separations. The ratios showed that the relative number of resignations was greatly reduced and the relative number of deaths slightly reduced in the two years, 1913, 1914, as compared with the years prior to 1912. This was probably the result of persons going out on pension who would have been forced to resign or remain in service until death, had no pension law been in effect. The number of separations in 1912 was so affected by the strike that that year was not considered in the adjustments to be made. The distributions of the total separations by cause, as shown in the experience of 1913 and of 1914, were then taken as a basis for adjusting the separations occurring in the first four years of the experience in such a manner that they would be distributed by cause in about the same proportions as they probably would have been had the retirement law been in effect throughout the entire experience.

Care was taken to make these adjustments conservatively and reasonably. The individual reports were studied to avoid inconsistencies, and an effort was made to secure a natural distribution which would afford an easy graduation of rates by preventing an artificial grouping of cases in any one age. The fact must be remembered that although these modifications in the assigned cause of separation were necessary before the data could be used as a basis for tables, they did not influence in any way the total rate of withdrawal from the active service, as the changes in the reports of the cause of separation were so effected as to make no changes whatever in the total rate of separations reported, in the number reported for any one year, or in the totals as regards the ages of employees at separation, with the single exception of the reduction made because of the strike. The extent of the changes made may be obtained by comparing the following summary showing the separations as reclassified with the preceding table showing the separations as originally reported.

TABLE 129—SUMMARY OF THE TOTAL NUMBER OF SEPARA-TIONS FROM ACTIVE SERVICE, CLASSIFIED BY YEARS AND CAUSE OF SEPARATION, AS MODIFIED BY THE PENSION COMMISSION

Department of Street Cleaning Relief and Pension Fund

CAUSE OF SEPARATION	Num	ER OF SEI	PARATIONS	-YEAR B	LMDING JU	NE 30	TOTAL
	1909	1910	1911	1912	1913	1914	
Resignation and Dismissal Death Disability Service Retirement	205 55 36 I	177 51 39 2	189 59 67 4	391 113 32 3	204 62 217 16	139 60 123 7	1,305 400 514 33
Total	297	269	319	539	499	329	2,252

Tabulations showing the number of separations from service brought out the fact that about 9% of the force left the service each year. This gross rate of separation indicated that the experience could not be used on an aggregate basis. A second tabulation was therefore made, in which the number of separations occurring in each of the first three years of service were tabulated separately for each year and separations occurring after the third year were combined. In this way the gross rate of separation was reduced from approximately 17% for employees in the first year of service to approximately 7% for employees with three completed years of service.

The following tables show the total numbers exposed to risk which were used as a basis for the rates for the active service and the pensioners.

TABLE 130—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Department of Street Cleaning Relief and Pension Fund

		V	/ITHDRAWA	LS		Separa-	0 - 1	
Years of Service	Exposed to Risk	Resig- nations	Dis- missals	Total	Deaths	tions by Disability	Service Retire- ments	Total Separa- tions
One Two	3214.0 3255.0	151 50	357	508 281	35 28			543 310
Three Ultimate	3060.5 26383.5	59 63 244	209 885	272 1,129	32 392	371	26	304 1,918
Total	35913.0	517	1,673	2,190	487	372	26	3,075

TABLE 131—SUMMARY OF EXPOSURE—SALARY

Department of Street Cleaning Relief and Pension Fund

Class	Number of Annual Salaries	Total Payroll
Active Members		\$19,803,910 932,950
Total	24,937	\$20,736,860

TABLE 132—SUMMARY OF EXPOSURE AND SEPARATIONS— EMPLOYEE PENSIONERS

Department of Street Cleaning Relief and Pension Fund

Class	Exposed to Risk	Deaths
Disability Pensioners	364 26	68
Total	390	71

The methods employed in the graduation of rates on the basis of select and ultimate experience have been outlined. In the Street Cleaning Department the rates of resignation and dismissal are primarily affected by length of service. These rates were therefore graduated directly from the data, but other rates for select years of experience were derived from the ultimate rates as described on page 29.

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

Rates developed on a select basis are compared first with rates developed on the same basis and then with aggregate rates. In order to make comparison with aggregate rates the select and ultimate rates have been respectively multiplied into a standard service exposure, which has been subdivided by years of service, and the expected cases of separation obtained in this way have been contrasted with the cases obtained by use of the comparative aggregate rate and the same exposure. This method is explained in detail on pages 392 and 393.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, diagrams are given on pages 254 to 257, showing the rates plotted on cross section paper.

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TABLE 133—RATES OF SEPARATION FROM ACTIVE SERVICE Department of Street Cleaning, Relief and Pension Fund

Total Total Farms Total Tota				RATES O	RATES OF WITEDRAWAL	1					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	RESIGNATION	NO				Disk	TYSSI		Total Ultimate	RATES	от Велти
	$rwq_{[s-1]+1}^{(a)}$ $rwq_{[s-2]+3}^{(a)}$	- 27		• q (a)	d w q (a)	d $\mathbf{w}q_{[x-1]+1}^{(a)}$	d w Q (x-2)+3	4 w q z	* q (a)	• q(a)	^d q(s) q(s-1)+1
1105 0.0468 0.0465 0.0465 0.0465 0.0465 0.0465 0.0465 0.0465 0.0475 0.0512 0.0512 0.0524 0.0524 0.0465 0.0		:		:	.0622	:	:	::	:	.0038	:
1105 0.0589 0.0465 0.0441 0.0441 0.0441 0.0444 0.0454 0.0464 0.0445 0.0544 0.0544 0.0544 0.0544 0.0544 0.0544 0.0544 0.0544 0.0545 0.0565 0.0682 0.0443 0.0248 0.0409 0.0545 0.0555 0.0655 0.0441 0.0248 0.0409 0.0555 0.0	.0383	:		 :	9980.	.0468	:	:	:	0400	7700.
1199 0710 0512 0357 0589 00445 00455 0	.030	.0309		:	. 1105	.0589	.0465	:	:	1400.	9700.
. 1203			Ģ	232	6611.	.0710	.0512	.0357	.0589	.0043	6700.
1126	. 0265		o.	203	. 1203	.0764	.0532	0300	.0493	.0040	.0052
0.876	· ·	· ·	o (181	.1128	.0750	.0524	.0204	.0445	.0050	.0050
0.0553	0220		9 2	1 ;	780	2000.	0440	246		8,8	5 × 5
	7010	_	5 0		0763	0503	1020	.0227	9360	9900	1200
	0180	-		, Y	9990.	.0437	.0342	.0218	.0333	.0071	.0076
. 0579 . 0362 . 0272 . 0203 . 0300 . 00882 . 00882 . 00884 . 00537 . 02443 . 02443 . 0195 . 0259 . 02885 . 00884 . 0253 . 02443 . 02443 . 0178 . 0259 . 02885 . 00884 . 0219 . 0213 . 0209 . 0219 . 0229 . 02	6910.	•	0.	×	.0615	.0390	.0300	1120.	.0316	.0075	9800.
0.0557	.0157		8	7.	.0579	.0362	.0272	.0203	.0300	.0078	.0084
. 0537 . 0345 . 0342 . 0187 . 0272 . 00884 . 0523 . 02443 . 0230 . 0178 . 0246 . 00889 . 0249 . 0249 . 0246 . 0246 . 00899 . 0249 . 0249 . 0246 . 0246 . 0091 . 0249	.0148	<u>.</u>	Š.	2	.0557	.0350	.0255	.0195	.0285	.0082	.0087
. 0523 . 0343 . 0330 . 0178 . 0259 . 0086 . 0519 . 0246 . 0089 . 0318 . 0212 . 0170 . 0246 . 0089 . 00498 . 0338 . 0212 . 0151 . 0234 . 0091 . 00493 . 0315 . 0188 . 0154 . 0213 . 0091 . 0091 . 0047 . 0213 . 0098 . 0147 . 0213 . 0098 . 0140 . 0250 . 0155 . 0135 . 0196 . 0100 . 0100 . 0100 . 0100 . 0118 . 0119 . 0118 . 0118 . 0118 . 0119 . 0118 . 0119 . 0118 . 0119 . 0118 . 0119 . 0118 . 0119 . 0119 . 0119 . 0119 . 0119	.0140	o	8	Ŋ	.0537	.0345	.0242	.018 ₇	.0272	-0084 4	0600
0.498	.0132		8	Ξ,	.0523	.0343	.0230	.0178	.0259	980°.	.0003
0.499	.0125		8	0 !	0210	.0340	.0223	0,10.	.0240	6800	2000
0486 0.015 0.047 0.023 0.0006 0.047 0.023 0.0006 0.0470 0.0293 0.0168 0.0147 0.0234 0.0006 0.0474 0.0250 0.0155 0.0135 0.0136 0.0100 0.0127 0.0189 0.0100 0.0127 0.0189 0.0100 0.0128 0.0156 0.0100 0.0156 0.			8 8	25	.0498	.0338	2120	1010.	.0234	1686	.000
0479 0293 0168 0141 0224 0098 0474 0250 0155 0135 0135 0196 0100 0134 0189 0189 0189 0189 0189 0189 0189 0189	8010		8 8	9	0486	.0315	0810.	.0147	.0213	, . , .	0103
0474 .0270 .0155 .0135 .0196 .0100 .0145 .0131 .0189 0189 0140 .0127 .0182 0170 .	.0103		8	63	0479	.0293	8910.	.0141	.0204	8000.	4010.
.0250 .0145 .0189 .0189 .0140 .0123 .0176 .0182 .0176 .0123 .0176 .0177 .0176 .0177	.0100		8	19	.0474	.0270	.0155	.0135	9610.	0100	.0107
0140 0127 0182 0176 0176 0170 0170 0170 0170 0170 0170	_	_	8	58	:	.0250	.0145	.0131	6810.	:	0100
0123 0120 0120 0115 0115 0115 0115 0116 0117 0118 0118 0119 0119 0119 01148 0107 0107 0107 0108 0107 0107 0107 0108 0107 0107 0108 0107 0107 0107 0107 0107 0108 0107	_	_	š	55	:	:	.0140	.0127	.0182	:	:
0120 0118 0166 0115 0115 0117 0117 0118 018 0190 0	š : - : -	_	ĕ	53	:	:	:	.0123	9/10.	:	:
0118 0115 0115 0113 0113 0115 0116 0116 0117 0118 0119 0119 0119 0119 0113 0119 0119	· :	_	o.	050	:	:	:	.0120	0170	:	:
0115 0113 0113 0115 0115 0106 0107 0106 0106 0107 0107 0108	· :	_	Ŏ.	248	:	:	:	8110.	9910.	:	:
0113 0112 0110 0110 0108 0109 0107 0104 0104 0104 0104 0104 0104 0104	· :		ġ.	245	:	:	:	.0115	0100	:	:
0112 0110 0110 0110 01008 01007 01007 01040 01040 01036 01036	· :	_	ĕ	243	:	:	:	.0113	.0156	:	:
0100 0108 0107 0107 0107 0106 0106 0109 0108	• :	• -	Ŏ.	040	:	:	:	2110.	.0152	:	:
0108 .0143 0107 0106 0136 0128 0128 0128 0128	• - : -	•	ŏ.	038	:	:	:	0110.	.0148	:	:
0107 .0140010601360136010401320102	: -	:	•	2035	:	:	:	8010.	.0143	:	:
0106 .0136	:	:		0033	:	:	:	.0107	.0140	:	
0104 .0132	:	:	•	0030	:	:	:	9010.	.0136		: :
2010.	: -	:		9028	:	:	:	.0104	.0132		: :
). 		<u> </u>	9020		:	-	.0102	8210.	-	: :

TABLE 133—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued Department of Street Cleaning, Relief and Pension Fund

			RATES	RATES OF WITHDRAWAL	. 4					
	RESIG	RESIGNATION			Disk	Diskissal		Total Ultimate	RATES	RATES OF DEATH
r er q (a)	req(a)	req(a)	' w q (a)	(a) Dan p	$d_{\mathbf{w}}q_{(x-1]+1}^{(a)}$	$d_{w}q_{[x-2]+3}^{(a)}$	4 w Q (a)	* q (a)	(z) b	4 (6)
:	:	:	.0023	:	:	:	0010.	.0123	:	:
:	:	:	.0021	:	:	:	8000.	6110.	:	:
:	:	:	9100.	:	:	:	\$660·	,0114	:	:
:	:	:	9100.	:	:	:	.0002	.0108	:	:
:	:	:	.001 4	:	:	:	8800.	.0102	:	:
:	:	:	.0012	:	:	:	.0084 4	9600.	:	:
:	:	:	0100.	:	:	:	0800	860°	:	:
:	:	:	800	:	:	:	.0074	.0082	:	:
:	:	:	000	:	:	:	800	.0074	:	:
:	:	:	7 000.	:	:	:	000 000	.0004	:	:
:	:	:	.000	:	:	:	.0053	.0055	:	:
:	:	:	:	:	:	:	.0044	.0044	:	:
:	:	:	:	:	:	:	.0034	.0034	:	:
:	:	:	:	:	:	:	.0023	.0023	:	:
:	:	:	:	:	:	:	1100.	1100.	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:

TABLE 133—RATES OF SEPARATION FROM ACTIVE SERVICE—Continued
Denorthment of Street Cleaning Relief and Pension Fund

					RATES	RATES OF DISABILITY	E				
RATES OF DEATH	<u> </u>		IN PERFORMANCE OF DUTY	ics of Dury			NOT IN PERFORMANCE OF DUTY	ANCE OF DUTE		Total	Kate of Service Retirement
€Q(a) (s-2)+3 €	• q ^(a)	a4rq(a)	$a^{4}rq_{(x-1]+1}^{(a)}$	atrq(a)	a1 q2	of Q(a)	of rq(a)	o(rq(a)	• (a)	'rq(a)	•rq(a)
		8									
	_	1000	1000	:	:	:	:	:	:	:	:
		1000	100	: 8	:	:	:	:	:	:	:
	2053	00.	1000	1000	. 000	:	•	:	:	: 8	:
<u>-</u>	8500	1000	1000	1000	000		•	:	:	3 8	:
<u>.</u>	2000	1000	1000	1000	8		: :	•	: :	8	:
_	2900	1000	1000	1000.	1000	800	: :	: :	: :	1000	• •
<u>.</u>	1700	1000	1000	1000	.000	0000	800			000	
<u>.</u>	9200	.0003	.0002	.0002	.000	8 8	000	8	: :	000	
<u>.</u>	9990	.000	.000	.000	.0002	1000	1000	1000	8	800	
<u>.</u>	4800	.000	.000	.000	.0002	.0003	.0004	7000	900	80	
<u>.</u>	2088	.0003	.0003	.0003	.003	.000	.800	800	8000	8	: :
٠ 	1600	.0003	.0003	.0003	.803	.0013	4100.	5100.	.0015	8100.	
٠ 	9000	000	4 000.	.0004	\$ 000.	7100.	8100.	0100	0100	.0023	
· —	9600	* 000.	900	† 000.	.000	.0022	.0024	.0025	. 0025	.0020	•
<u>.</u>		-000 -	2000.	.0005	000 500 500	.0027	.0029	.0030	. 8030	.0035	. :
-	1010	.0005		\$000 \$	80 80	.0031	.0033	.0035	.0035	0400	:
-	0104	000.		9000	9000	.0038	1400.	.0042	.0042	.0048	:
· `	0100	.0005	9000	9000	9000	.0043	.0046	.0047	.0047	.0053	:
-	0100	So.	000	000	8 8	1500.	.005 4	.0056	.0056	.0062	:
٠ -	IIIO	000	9000	900	9000	85 85 85	.0062	.0064	4 900.	0200.	:
-	oii3	:	9000	900	900	:	2900.	6900 .	6900.	.0075	:
-	OIIS	:	:	9000	9000	:	:	9200.	9200.	.0082	:
· '	0110	:	:	:	0 0 0 0	:	:	:	.0085	1600.	:
- ·	9110	:	:	:	900 000	:	:	:	4000.	0010.	:
•	6110	:	:	:	8	:	:	:	00100	9010.	:
· `	0130	:	:	:	800 800	:	:	:	0110.	.0115	:
: ' 	1210	:	:	:	2005	:	:	:	.0120	.0125	:
-	0122	:	:	:	8 8	:	:	:	.0130	.0135	:
•	0124	:	:	:	4000	:	:	:	.0141	.0145	:
· '	0125	:	:	:	4000	:	:	:	.0152	0150	:
- `	0210	:	:	:	.0003	:	:	:	9910.	.0160	
-	0127	:	:	:	.003	:	:	:	.0170	.0182	•
_	0110	: :	:	:	.0003	:	:	:	0010	0303	:
					.000	:			44		:

TABLE 133-RATES OF SEPARATION FROM ACTIVE SERVICE-Continued

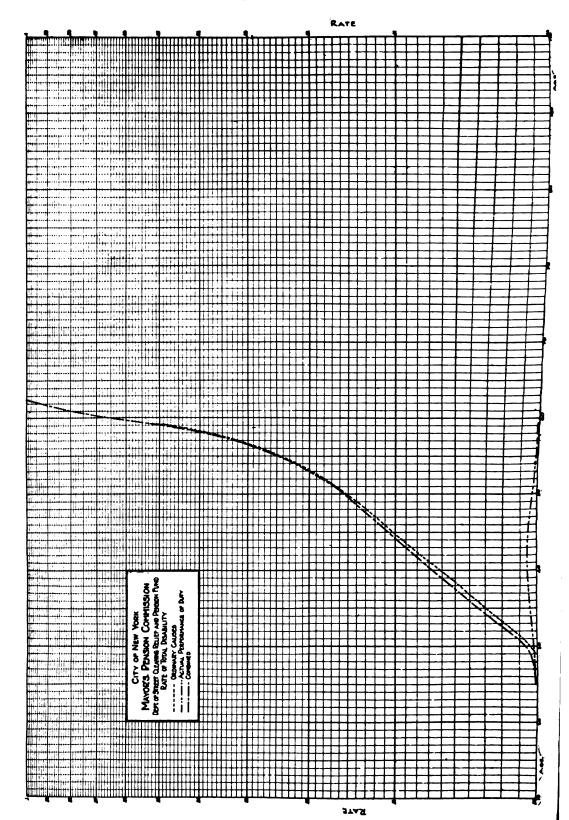
pun
2
Pension
and
Relief
Cleaning
of Street
Department

					RATES (RATES OF DISABILITY	>			-	Rate of
RATES OF DEATH	В		IN PERFORMANCE OF DUTY	CR OF DUTY		ğ	NOT IN PERFORMANCE OF DUTY	ics of Dury		Total Ultimate	Service Retirement
4Q(x-z)+2	4 q (a)	asrq(a)	$\left \begin{array}{c}ai_rq^{(a)}\\[1mm] [x-1]+1\end{array}\right $	asrq(a) qr-z)+2	a1rq(a)	of, Q(a)	$^{ot}q_{[x-1]+1}^{(a)}$	of q(a)	otrq(a)	$^{\prime}_{r}q_{x}^{(a)}$	•rq(a)
:	.0132	:			.000	:			.0248	.0250	:
:	.or34	:	:	:	.0002	:	:	•	.0279	.0281	:
:	.0135	:	:	:	.000	:	:	:	.0323	.0325	:
:	.0137	:	:	:	1000	:	:	:	.0387	.0388	:
:	.0139	:	:	:	1000.	:	:	:	.0499	.0500	:
:	.0142	:	:	:	1000.	:	:	:	6990.	0290.	.0003
:	.0145	:	:	:	1000.	:	:	:	6080.	0180.	.0183
:	.0148	:	:	:	1000.	:	:	:	.0934	.0935	.0259
:	.0152	:	:	:	1000	:	:	:	1044	. 1045	.0327
:	.0156	:	:	:	:	:	:	:	.1140	.1140	.0395
:	1910.	:	:	:	:	:	:	:	.1220	.1220	.0459
:	.0167	:	:	:	:	:	:	:	.1278	.1278	.0525
:	.0173	:	:	:	:	:	:	:	.1332	. 1332	.0589
:	0810.	:	:	:	:	:	:	:	.1385	.1385	.0057
:	.0188	:	:	:	:	:	:	:	. 1440	. 1440	.0727
:	.0195	:	:	:	:	:	:	:	. 1400	. 1400	7670.
:	.0204	:	:	:	:	:	:	:	.1540	.1540	.0078
:	.0222	:	:	:	:	:	:	:	. 1590	. 1590	0000
:	.0223	:	:	:	:	:	:	:	. 1038	.1038	. 1050
:	.0239	:	:	:	:	:	:	:	. 1085	. 1005	.1142
:	.0253	:	:	:	:	:	:	:	.1720	.1720	.1242
:	.0270	:	:	:	:	:	:	:	.1700	.1700	.1350
:	.0289	:	:	:	:	:	:	:	.1798	2021.	.1470
:	.0316	:	:	:	:	:	:	:	. 1820	.1820	. 1597
:	.0332	:	:	:	:	:	:	:	1859	.1859	. 1728
:	.0350	:	:	:	:	:	:	:	. 1887	1887	.1870
:	.0383	:	:	:	:	:	:	:	8161.	8161.	. 2030
:	00400	:	:	:	:	:	:	:	· 1945	. r945	. 2200
:	.0443	:	:	:	:	:	:	:	.1972	.1972	. 2380
:	.0475	:	:	:	:	:	:	:	.3000	2000	. 2590
:	.0508	:	:	:	:	:	:	:	. 2030	. 2030	. 2810
:	.0545	:	:	:	:	:	:	:	. 2050	. 2050	.3000
:	.0583	:	:	:	:	:	:	:	. 2075	. 2075	.3310
:	.0025	:	:	:	:	:	:	:	2100	2100	.3010
	.0010	:							. 2135	212	3020

BATE

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RATE



RATES OF RESIGNATION AND DISMISSAL

The rate of resignation in the Street Cleaning Department is the lowest of all similar rates developed on a select basis. The corresponding rate for the division laborers, of the City of New York Employees' Retirement Fund, is the next higher rate and is more than double that for street cleaners during the first year of service and about three times that rate in the ultimate years. Considering the select and ultimate rates together and weighing them according to their relative importance we find that, as an aggregate rate, the street cleaners' rate of resignation ranks about fifth among the seven rates of resignation for city departments reporting such a rate and lies between the corresponding rate for laborers and that for policemen.

The rate of dismissal, unlike that of resignation, is the highest of all such rates in the city service and this is true not only of the select rate for the first year and of the ultimate rate, but also of the aggregate rate derived by combining the select and the ultimate rates weighed according to their relative importance. The corresponding rate for the division, laborers of City of New York Employees' Retirement Fund, ranks second to that for street cleaners as a rate of dismissal.

The aggregate rate of withdrawal made up of the rates of dismissal and of resignation combined, ranks sixth among all rates of withdrawal in the city service and lies between the rate for mechanics, which is higher, and that for women teachers, which is lower. Apparently the employees of the Street Cleaning Department generally prefer to remain in service; and the withdrawals are largely the result of dismissal for breach of discipline or physical unfitness for duty.

RATE OF DEATH

Two rates of death in the active service were needed for valuation purposes, one covering deaths in performance of duty and the other covering other deaths. As the reports did not give sufficient experience regarding deaths in performance of duty to afford a basis for the development of such a rate, a single rate of death was prepared and the assumption was made that a certain proportion of all the deaths which occurred in the service were the result of actual performance of duty.

A bulletin of the United States Bureau of Labor Statistics, No. 157, on Industrial Accident Statistics, gives the ratio of accidental deaths to total deaths by occupations in the registration area of the United States for the years 1908-1909. According to this report among teamsters 13.7% of the total deaths are accidental; among hostlers, 9.8%; among non-agricultural laborers, 9.9%. According to the statistics of the Prudential Life Insurance Company, quoted in this same volume, based on the period 1907 to 1912, 12.2% of total deaths among draymen and teamsters are accidental. That the cost of the benefit allowed in the Street Cleaning Department on accidental death might be fully covered 12.5% of total deaths were assumed to occur in actual performance of duty. This ratio would place the rate about first of all departments having accidental death rates. As the statistics on the experience of the fund accumulate the actual data may show this assumption to be slightly high or low, but as the benefit allowed on ac-

cidental death is not costly as compared with other benefits of the fund, no material effect on the entire liability of the fund will probably result.

Because of the method employed in determining the value of benefits on death in performance of duty no rate of death from other causes need be discussed.

The total rate of death considered as an aggregate rate stands about fourth among all corresponding rates and is higher than any other rate with the exception of that for the classes considered in the City of New York Employees' Fund who have no disability allowance which is available during their first thirty years of service.

RATE OF DISABILITY

Two rates of disability for the Street Cleaning Department were required, one for disability in performance of duty and one for disability from other causes. The rate of disability in performance of duty could not be developed from the data because they appeared insufficient to yield a true rate. The law allows a pension of \$300 per annum in case of disability in performance of duty, while after ten years of service it allows, for disability from other causes, a pension of half salary. Evidently persons disabled after ten years of service would not claim upon the ground that they were disabled in performance of duty, as a larger pension could be secured under the general disability provision. This condition would seem to indicate that a rate of disability in the actual performance of duty derived from the experience, even if the experience had been larger than it was, would have reflected only cases of such disability as had accrued in the first ten years of service. The Commission, therefore, derived a single rate of disability from the experience and then subdivided this rate into the two rates required. In the calculation of the cost of pensions the clause covering disability in performance of duty was considered to apply only to cases of disability in performance of duty which occur in the first ten years of service. All cases of disability from any cause after ten years of service were valued as coming under the other provision.

The rate of disability in performance of duty follows the general form of similar rates for the city service. The rate is the lowest for the four funds for which such rates were derived.

The rate of disability not in performance of duty, taken as a whole, is the second highest rate among corresponding rates in the city service and is exceeded only by that for policemen.

The two rates taken together as a single total rate of disability form a rate which is second as regards all corresponding rates of the city service. It is exceeded by the corresponding rates for the Police Department and followed by that for the Fire Department.

RATE OF SERVICE RETIREMENT

The rate of service retirement, as has previously been explained, was adopted after allowance had been made in the other rates of withdrawal for its introduction. The rate taken as a whole up to age 65, ranks lowest among all retirement rates applying to city funds, the next higher rate being for laborers.

RATE OF SALARY CHANGE

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

The following table shows the rates used in the construction of all the pensioners' tables except that for dependents. A diagram showing the rates of mortality plotted on cross section paper is given on page 261.

TABLE 134—RATES OF MORTALITY AMONG PENSIONERS

Department of Street Cleaning Relief and Pension Fund

Age	Disability	Service	Age	Disability	Service
20	. 2080		60	. 1205	. 0605
21	. 2070		61	.1102	. 0636
22	. 2050		62	. 1185	. 0668
23	. 2030		63	1 .1180	. 0700
24	. 2010		64	. 1185	. 0730
25	. 1992	١	65	.1194	.0776
26	. 1975	l	66	. 1208	.0818
27	. 1960		67	. 1230	. 0860
28	. 1940	l	68	. 1262	.0000
29	. 1020		69	.1302	. 0060
30	. 1000		70	.1360	. 1010
31	. 1880	l	71	. 1430	. 1080
32	. 1862		72	.1520	. 1150
33	. 1845		73	. 1610	. 1220
34	. 1822	١	74	. 1725	. 1300
35	. 1805	l	75	. 1825	. 1300
36	.1780		76	. 1040	. 1500
37	.1758	l	77	. 2050	. 1605
38	.1735		78	. 2180	.1725
39	.1710	l	79	. 2325	. 1865
40	. 1688		80	. 2500	. 2030
41	. 1663	·	81	. 2675	. 2180
42	. 1640	.	82	. 2875	. 2360
43	. 1617	l	83	.3085	. 2530
44	. 1595		84	.3302	. 2720
45	.1570		85	.3560	. 2010
46	.1545	l	86	. 3802	.3140
47	. 1520		87	.4100	. 3380
48	. 1493		88	.4400	. 3660
49	. 1468		89	.4700	.3950
50	. 1440		90	. 5050	.4270
51	.1415	• • • •	91	. 5450	. 4620
52	. 1385		92	. 5900	. 5000
53	. 1358		93	.6350	. 5400
54	. 1330		94	.6850	. 5900
55	.1302		95	. 7350	. 6400
56	. 1280		96	.7900	. 7200
57	.1255	1	97	.8500	.7759
58	. 1236		98	.9150	. 8450
59	. 1220	l	99	. 0800	. 9200

DISABILITY PENSIONERS' DEATH RATE

The rate of mortality among disability pensioners of the Street Cleaning Department is generally the highest of all similar departmental rates; the rate used for valuing pensions in the Supreme Court funds and the Fire Department fund being the next two highest rates. It falls generally between the mortality rate derived by Franklin Mead from the experience of the Order of the Maccabees and the rate derived by Sidney Pipe from the experience of Fraternal Orders in Canada. It remains higher throughout than Hunter's rate derived from various funds, which is used by some of the insurance companies for valuing certain annuities on disabled lives.

SERVICE PENSIONERS' DEATH RATE

The experience was not sufficiently complete to give a probable rate of mortality for service pensioners; a rate was therefore adopted which had been based on a similar experience. It is a little lower than the rate applying to disability pensioners but it is higher than standard rates of mortality, and is the highest rate of mortality used in the valuation of service pensions.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The construction of mortality tables and select service tables has been described. The following tables are based on the rates discussed above:

TABLE 135-SELECT ACTIVE SERVICE TABLE AND SALARY SCALE

Department of Street Cleaning Relief and Pension Fund

				CORL				WITEDRAWALS	\WALS		
							Resign	ations		Diez	issals
1,000,000 1,000,000 1,00	You Y		1	l _{[3} =3]+2	(g) 2 2 3	$^{r}w_{[x]}^{(a)}$	$^{r}w_{\left[x-1 ight] +1}^{\left(a ight) }$	$^{r}w_{[x-3]+3}^{(a)}$	7 U (8)	(a) (b) (b)	$^{oldsymbol{d}}w_{[oldsymbol{x}^{-1}]+1}$
959,305 844,307 10,000 41,334 23,879 24,922 100,022 100,022 10,03	 	00,0		:	:	47,000		:		62,200	
92,446 92,589 758,004 758,004 758,589 758,504 758,504 758,504 758,504 758,504 758,504 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,005 16,138 16,005 16,138 <t< td=""><td></td><td>9,536</td><td>842,507</td><td>807,511</td><td>::</td><td>43,659</td><td>30,920</td><td>24,952</td><td>: :</td><td>106,029</td><td>49,624</td></t<>		9,536	842,507	807,511	::	43,659	30,920	24,952	: :	106,029	49,624
Stratog 744,34 678,24 655,44 34,900 23,17 16,018 11,847 16,138 16,018 11,847 16,138 16,018 11,847 16,138 16,018 11,847 16,138 16,018 11,847 16,138 16,018 11,847 16,138 16,018 11,847 16,138 16,018 11,847 16,138 16,018 16,138 16,138 16,018 16,138 1		2,621	805,899	758,014	741,060	41,334	28,287	21,755	17,155	110,622	57,219
1753,552 668,428 604,068 611,078 31,772 30,098 11,405 11,40		2,098	724,334	678,284	655,249	34,920	23,179	16,618	11,827	91,605	54,325
651,097 603,003 505,034 505,034 10,000 11,10		2,352	681,428	642,685	621,978	31,712	20,988	14,653	10,013	76,138	46,473
58,1935 551,095 541,102 24,441 15,325 9,936 6,213 40,900 551,405 526,096 518,673 22,888 14,042 8,906 5447 35,905 551,406 554,406 526,098 518,673 21,040 7,018 46,906 55,905		1,69,1	603,603	579,499	595,525	26,393	106,91	11,242	7,183	49,073	30,301
\$55,825 \$544,922 \$520,995 \$10,002 \$14,002 \$5,900 \$5,447 \$35,905 \$55,805 \$55,805 \$50,900 \$50,402 \$50,900 \$50,40		4,111	571,819	551,995	541,192	24,441	15,325	9,936	6,213	40,900	24,988
533.873 533.873 533.873 533.873 533.873 533.873 533.873 647.8894 644.161 646.280 646.2		3,825	544,202	\$20,998	518,073	22,828	14,042	8,906	5,447	35,905	21,220
\$12,446 4/8,924 4/64,661 4/8,922 11,206 6,498 3,510 27,508 \$12,446 446,788 441,034 17,899 10,497 5,884 3,551 24,718 \$47,083 441,034 17,899 10,497 5,884 3,551 24,571 \$47,083 441,034 17,899 10,497 5,884 3,551 24,571 \$453,233 442,094 441,094 15,054 3,554 3,551 24,571 \$41,885 394,045 37,049 16,924 9,150 4,176 24,99 24,576 \$41,886 317,320 360,453 37,940 16,204 4,176 24,99 20,309 \$41,886 31,339 360,453 360,453 360,453 360,453 360,463 360,494 4,114 2,499 20,309 \$41,886 31,339 360,453 360,463 360,463 360,463 360,463 360,464 360,464 360,464 360,464 360,464 360,464		3,873	408,866	483,644	477,760	20,020	12,023	7,162	4,300	20,737	17,460
441,052 460,407 445,788 441,052 17,899 10,497 5,884 3,551 25,718 472,683 442,592 424,532 424,532 424,532 424,533 425,592 426,902 9,781 5,587 3,236 224,533 425,593 412,096 408,007 15,065 8,588 4,478 23,537 3,240 23,571 24,060 392,090 15,005 8,588 4,478 23,090 14,796 23,730 23,544 7,090 14,290 4,478 23,090 14,796 23,732 36,304 4,478 23,732 36,307 13,544 7,210 3,524 4,478 23,007 15,009 14,796 3,524 4,478 23,000 14,796 3,524 4,478 23,000 14,794 23,00	_	2,246	478,894	464,161	458,922	18,953	11,206	6,408	3,910	27,508	16,522
453.41 443.50 444.134 15.922 93.701 53.357 32.30 23.537 443.533 443.533 443.533 443.533 443.533 443.533 443.533 443.533 443.533 443.533 443.533 33.541 15.954 15.954 15.954 15.954 15.954 15.955 15.95		1,739	460,407	445,788	441,052	17,899	10,497	5,884	3,551	25,718	15,792
435,411 408,930 390,309 435,411 408,930 390,309 390,931 390,931 390,931 390,931 390,931 390,931 390,931 390,931 390,931 390,932 330,942 330,942 330,942 330,943 330,944 330,943 330,94		2,003	442,590	420,592	424,124	10,922	9,781	5,357	3,230	24,532	15,049
417,885 392,931 380,918 377,996 14,250 8,094 4,114 2,499 20,309 20,309 377,320 350,453 350,423 13,544 7,622 3,774 2,307 19,222 350,453 353,448 350,323 353,448 13,744 2,307 19,222 353,448 330,016 337,137 1,756 3,524 3,119 18,266 3,324 1,794		5,411	408,050	306,269	392,699	15,065	88	4.478	2,726	21,466	13,495
401,294 377,320 366,453 363,942 13,544 7,622 3,774 2,307 19,222 385,369 346,023 359,448 359,327 12,756 7,210 3,524 2,119 18,266 3,324 3,119 18,266 3,324 1,949 17,9		7,885	392,931	380,918	377,996	14,250	8,004	4,114	2,499	20,309	12,378
348,023 335,1440 35,524 1,010		1,294	377,320	366,453	363,942	13,544	7,622	3,774	2,307	19,222	11,055
326,200 334,451 326,200 334,451 300,100 288,545 277,274 277,274 277,274 277,274 277,274 277,274 277,274 277,133 224,035 224,035 225,643 226,643 226,643 226,643 226,643 227,33 226,643 227,33 22		605.5	302,333	352,440	350,327	12,750	7,210	3,524	2,119	10,200	20,703
312,164 309,199 309,199 309,199 305,299 205	-	: :	Sanfake 	326,200	324,451	::	276	3,000	1,704	: :	: ::
300,199 288,545 266,299 265,299 265,299 245,133 245,133 245,133 234,935 205,643 205,643 205,643 205,643	6	:	:	:	312,164	:	:	``: ::	1,648	:	:
288.545 277,274 265,360 245,133 245,133 245,133 245,078 234,078 215,200 205,643 205,643 205,643 205,643 205,643 205,643	4	:	:	:	300,199	:	:	:	1,504	:	:
277,274 266,399 256,399 255,386 24,978 224,978 205,043 205,043	· •	:	:	:	288,545	:	:	:	1,379	:	:
206,299 255,586 245,133 244,978 215,209 205,043 205,043	φ:	:	:	:	277,274	:	:	:	1,253	:	:
255.580 245.133 244.978 215,209 215,209 205,643 205,643 205,643	_	:	:	:	266,299	:	:	:	1,134	:	:
245.133 234-978 224-978 215,209 205,643 205,643	 50 (:	:	:	255,580	:	:	:	1,022	:	:
2344935 2449078 215,200 205,643 205,643 205,643 205,643	-	:	:	:	245,133	:	:	:	922	:	:
215,200 546,800 573 573 573 573 573 573 573 574 574 575	-	:	:	:	234,935	:	:	:	825	:	:
245,500 205,643 196,130 196,130		:	:	:	224,976	:	:	:	734	:	:
1906,130		:	:	:	215,200	:	:	:	040	:	:
	2.5	:	:	:	205,043	:	:	:	573	:	:
		:	:	:	190,130	:	:	:	200	:	:

TABLE 135—SELECT ACTIVE SERVICE TABLE AND SALARY SCALE—Continued

61(6) : : : : : : : : : : : : : :: : : : : : : : : : Diemiseale : êw E : : : : 372 314 259 259 250 21 250 31 31 31 : : rw(a) : : : : : : : : : : : : : : : WITHDRAWALS $rw_{[x-2]+3}^{(a)}$:: Department of Street Cleaning Relief and Pension Fund Resignations 7w(a) [3-1]+1 : e E 123,455 99,866 99,866 99,866 64,355 52,165 92,704 10,772 1 177,294 167,835 158,200 148,173 €, J(a) J(x-2)+3 : LIVING 150 1511+11 : <u> S</u> AGE

TABLE 135-SELECT ACTIVE SERVICE TABLE AND SALARY SCALE-Continued Department of Street Cleaning Relief and Penalon Fund

		WITHDRAWALS		ۇ ئ	SEPA	SEPARATIONS BY DISABILITY	E i	Service Re-	Selection Control
	Dismissals	issals	Total Ultimate		In Performance of Duty	Other Causes	Total	tirements	outry scale
AGE	⁴ 10(a)	6 ₁₀ (6)	(9) <i>0</i> 3	$d_{[s]}^{(a)}$ $d_{[s]}^{(a)}$ $d_{[s-1]+1}^{(a)}$ $d_{[s-2]+2}^{(a)}$ $d_{[s-2]+2}^{(a)}$	67 (6) 17 (6) 17 (6) 17 (7) 17	(1,0) (1,0) (1,0) (1,0) (1,0) (1,0) (1,0) (1,0) (1,0) (1,0) (1,0)	(7. (a) (7. (b) (7. (c) (7. (c) (7. (d) (7. (d) (7. (d) (8. (d) (7. (d) (8. (d) (8. (d) (9.	8 d (8)	5 _[2] 5 _[2-1] +1 5 _[2-2] +2 1, 5 ₂
20	:	:		3,840	9*	:	46		752
21	:	•	:	3,870	. \$::	4	: :	200
22	37,550	:	:	3,896	53	:	52.	:	770
33	38,810	26,456	43,611	3,935	280	:	88	:	778
47.0	38,112	20,110	34,153	3,994	.	:	.	:	785
Ç 4	35,543	17,299	29,126	4,076	\$:	6	:	792
2.5	31,492	15,425	25,438	4,130	22	:	75	:	200
7 6	27,012	13,979	22,390	4,223	*	=	95	:	804
200	0,0,0	12,040	20,023	4,293	2	61	113	:	% XIO
9 6	16,870	10.044	16,011	4,345	101	50	103	:	815
31	13.717	10.101	14,034	4,260	117	192	110	:	010
32	12,338	0.316	13,616	4.362	153	707	200 800 800	•	833
33	11,233	8,582	12,492	4,323	172	883	1,055	: :	827
34	10,254	7,851	11,402	4,247	189	1,090	1,279	:	828
35	9,558	7,211	10,447	4,186	203	1,281	1,484	:	829
8	8,736	ó,58 <u>9</u>	9,551	4,125	211	1,421	1,632	:	830
700	7,840	0,028	8,754	4,004	210	1,069 1,069	1,885	:	831
0 0	0,050	5,549	5,048	4,003	218	1,785	2,003	:	832
5	251.0	5,113	7,420	3,930	217	2,040	2,257	:	833
. 4	4.016	414	0,000	3,0/2	2,40	2,230	204,2	:	93
42	4.567	4.114	0000	2,718	800	2,462	2,540	:	20.00
43	: :	3,846	5,404	3,630	188	2,653	2,841	: :	22
\$:	3,611	5,115	3,537	1771	2,825	3,002	:	838
45	:	3,399	4,778	3,434	164	2,895	3,059	:	838
9	:	3,197	4,450	3,336	150	3,039	3,189	:	830
47	:	3,017	4,151	3,233	135	3,194	3,329	:	839
5 6	:	2,850	3,872	3,130	120	3,331	3,451	:	830
4 n	:	2,092	3,014	3,030	7 01	3,450	3,554	:	830
2	:	2,540	3,305	2,927	68	3,570	3,005	:	× 60
10	:	2,403	3,137	2,630	75	3,727	3,802	:	\$ 6 6
5 8	:	2,7,0	016'8	2,731	* :	3,053	3,917	:	040
3 3	:	4,139	71/12	2,047	* :	901,4	4,154	:	040
5.5	:	86.	4,00,0	2,550		4,300	4,354	:	0 10
		/22(-	26212	2011	30	4504	4,009		041

TABLE 135-SELECT ACTIVE SERVICE TABLE AND SALARY SCALE-Continued Department of Street Cleaning Relief and Penaion Fund

		WITHDRAWALS		r T	SEP	SEPARATIONS BY DISABILITY	urry	Service Re-	
	Dism	Dismissals	Total Ultimate		In Performance of Duty	Other Causes	Total	tirements	
AGE	4w(a) 21+2	4.10 (6)	(9 n	$d^{(a)}_{(x)}$ $d^{(a)}_{(x-1)+1}$ $d^{(a)}_{(x-2)+2}$ $d^{(a)}_{(x)}$	647(0) 647(2) 647(2-1)+1 647(2-2)+2 647(0)	ofr(a) ofr(z) ofr(z-1) + 1 ofr(z-2) + 2 ofr(z)	$f_{T}(0)$ $f_{T}(0)$ $f_{T}(0)$ $f_{T}(0)$ $f_{T}(0)$ $f_{T}(0)$ $f_{T}(0)$ $f_{T}(0)$ $f_{T}(0)$	(9) 4 6	5 [5] 5 [5-1]+1 5 [5-2]+3 5
26	:	1,734	2,106	2,371	3ř	4,951	4,982	:	843
27	:	1,594	806,1	2,272	92 5	5,429	5,455	:	843
26		1,304	1,714	2.004		7,302	7.400	: :	847
8		1,152	1,317	1,047	13	9,178	161'6	1,276	848
19	:	186	1,105	1,785	01	066'6	10,000	2,259	849
70	:	801	887	1,601	••	611'01	10,127	2,805	850
3 2	:	027	083	1,408	1 0 ·	9,702	9,707	3,037	150
2		238	499	1,210	* °	4,00,4	0,000	3,003	200
8		230	230	860		6,665	6.666	2.730	000
29	:	142	142	720		5,548	5,549	2,454	860
8	:	92	2	290	:	4,54x	4,541	2,155	198
9	:	30	6	477	:	3,662	3,662	1,849	863
2:	:	:	:	379	:	2,889	2,889	1,547	865
7 6	:	:	:	202	:	2,240	2,248	1,282	202
7 2	:	:	:	239	:	1,712	1,712	1,034	870
2 :	:	:	:	173	:	1,275	1,275	818	871
1,5	:	:	:	132	:	930	930	030	573
3,5	:	:	:	26	:	650	020	475	027
2 5	:	:	:	۶,	:	457	457	351	000
7 5	:	:	:	လွ	:	8	300	253	100
0 6	:	:	:	38	:	202	203	177	888
2.5	:	:	:	23	:	129	621	130	888
3:	:	:	:	SI	:	<u>چ</u>	ဋ္ဌ	2	& &
Z 6	:	:	:	6	:	48	*	ဇ္	893
70	:	:	:	7	:	27	27	ဇ္တ ဇ	968 6
3 8	:	:	:	4	:	ží.	I.S.	201	66g
\$:	:	:	:	~	:	••	90	ខ	8
200	:	:	:	H	:	4	₹	•	8
3 8	:	:	:	:	:	~	~	•	903
) œ	:	:	:	:	:	H	H	ы	206
3 8	:	:	:	:	:	:	:	-	010
					_	_			

TABLE 136—DISABILITY PENSIONERS' MORTALITY TABLE

Department of Street Cleaning Relief and Pension Fund

Age	Living $l_z^{(i)}$	Dying $d_x^{(i)}$	Age	Living (f)	Dying $d_{z}^{(0)}$
20	2,000,000	416,000	55	2,468	321
21	1,584,000	327,888	56	2,147	275
22	1,256,112	257,503	57	1,872	235
23	998,609	202,718	58	1,637	202
24	795,891	159,974	59	1,435	175
25	635,917	126,674	60	1,260	152
26	509,243	100,576	61	1,108	132
27	408,667	80,099	62	976	116
28	328,568	63,742	63	86o	101
29	264,826	50,847	64	759	90
30	213,979	40,656	65	669	80
31	173,323	32,584	66	589	71
32	140,739	26,206	67	518	64
33	114,533	21,131	68	454	57
34	93,402	17,018	69	397	52
35	76,384	13,787	70	345	47
36	62,597	11,143	71	298	42
37	51,454	9,045	72	256	39
38	42,409	7,358	73	217	35
39	35,051	5,994	74	182	32
40	29,057	4,905	75	150	27
41	24,152	4,016	76	123	24
42	20,136	3,302	77	99	20
43	16,834	2,722	78	79	17
44	14,112	2,251	79	62	15
45	11,861	1,862	80	47	12
46	9,999	1,545	81	35	9
47	8,454	1,285	82	26	7 6
48	7,169	1,070	83	19	6
49	6,099	896	84	13	4
50	5,203	749	85	9	3
51	4,454	630	86		4 3 3 1
52	3,824	530	87	3	
53	3,294	447	88	2	1
54	2,847	379	89	1	I

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TABLE 137—SERVICE PENSIONERS' MORTALITY TABLE

Department of Street Cleaning Relief and Pension Fund

Age	Living (9)	Dying $d_z^{(p)}$	Age	Living (9)	Dying $d_z^{(p)}$
38	42,408	679	68	10,845	986
39	41,729	717	69	9,859	946
40	41,012	763	70	8,913	909
41	40,249	805	71	8,004	864
42	39,444	848	72	7,140	821
43	38,596	888	73	6,319	771
44	37,708	927	74	5,548	721
45	36,781	957	75	4,827	671
46	35,824	989	76	4,156	624
47	34,835	1,020	77	3,532	567
48	33,815	1,048	78	2,965	511
49	32,767	1,082	79	2,454	458
50	31,685	1,109	80	1,996	405
51	30,576	1,137	81	1,591	347
52	29,439	1,166	82	I,244	294
53	28,273	1,185	83	950	240
54	27,088	1,197	84	710	193
55	25,891	1,212	85	517	150
56	24,679	1,216	86	367	116
57	23,463	1,220	87	251	85
58	22,243	1,221	88	166	60
59	21,022	1,209	89	106	42
60	19,813	1,199	90	64	27
61	18,614	1,184	91	37	17
62	17,430	1,164	92	20	10
63	16,266	1,139	93	10	5
64	15,127	1,118	94	5 2	\$ 3 1
65	14,009	1,087	95		I
66	12,922	1,057	96	I	1
67	11,865	1,020	ll I		

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The following table is based on an assumed entrance salary of \$1,000 and shows the present value of the total salary to be earned during active service and the present value of the various types of pensions that may be paid as described in the enumeration of benefits on page 244. Due allowances have been made, of course, for increases in salary and for the fact that many of the benefits are based on final salary.

TABLE 138-PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS THEIR FAMILIES, BASED ON AN ENTRANCE SALARY OF \$1,000, FOR VALUES DETERMINED BY SALARY AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS, PAYABLE TO THESE MEMBERS AND AND ON AVERAGE PENSIONS FOR VALUES NOT DETERMINED BY SALARY

Department of Street Cleaning Relief and Pension Fund

				PENSIONS		TO MEMBERS		14	PENSIONS TO WIDOWS	o Widows		E.	PENSIONS TO CHILDREN	CHILDRE		PENSIO	Pensions to Dependent Parents	ENDENT
		Total			UPO	UPON DISABILITY	E	,	OF MEMBERS Dying	KBERS			OF MEMBERS Daing	(BEES			OF MEMBERS Daing	MBERS
AGE	*Total	₽ V		Upon		In Per-			IN SE	EVICE	Member		IN SERVICE		Members		IN SE	EVICE
ENTRANCE	Salary	Pension Benefits	Total	Service Retire- ment	Total	formance of Duty During First 10 Years Service	All Causes After 10 Years Service	Total	While in Per-formance Orc	o i i i	Dying While on Pension	Tot	While Norwall Normal Normal Causes Per Causes Duty	From Ordinary Causes	Dying While on Pension	Total	While in Per- formance Ordinary of Causes	From Ordinary Causes
20	\$10,639	\$387	\$154	\$ 18	\$136	14	\$135	\$193	\$27	\$ 0 4	\$72	\$11	ä	\$7	£	\$29	*	\$25
25	10,044		210	56	184	н	183	240	37	101	102	13	ď	9	4	33	4	50
30	10,796		318	43	275	8	272	316	Sı	115	150	13	7	9	S	27	4	23
32	10,495		419	49	355	S	350	340	55	101	184	12	61	v	w	33	8	61
-	9,972		533	95	828	v	433	359	55	16	213	H	"	4	v	22	m	61

*Total future salary estimated without use of "rix column, which was used to obtain cost of service pension only.

The expectation of life and present value of a pension of one to service and disability pensioners are shown in the following table:

TABLE 139—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY AND SERVICE PENSIONERS

Department of Street Cleaning Relief and Pension Fund

	ANNUIT	VALUE	Ехрестаті	on of Life		ANNUIT	Y VALUE	EXPECTATI	ON OF LIFE
AGE	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners	AGE	Disability Pensioners	Service Pensioners	Disability Pensioners	Service Pensioners
20	3.80		4.49		60	5.71	7.60	7.00	10.03
21	3.83		4.53		61	5.66	7.45	6.00	9.64
22	3.86		4.59		62	5.59	7.22	6.87	9.27
23	3.90		4.64		63	5.50	6.99	6.73	8.89
24	3.94		4.69		64	5.40	6.76	6.56	8.52
25	3.98		4 - 75		65	5.28	6.53	6.38	8.17
26	4.01		4.81		66	5.15	6.30	6.17	7.81
27	4.05	• • •	4.87	• • • •	67	5.00	6.07	5.95	7.46
28	4.10	• • • •	4 - 93	• • • •	68	4.83	5.84	5.72	7.12
29	4.14	• • •	5.00	• • • •	69	4.66	5.60	5 - 47	6.78
30	4.18	• • • •	5.06	•••	70	4 · 47	5.37	5.21	6.44
31	4.23	• • • •	5.13	• • • •	71	4.28	5.14	4.94	6.12
32	4.28	• • •	5.21	• • • •	72	4.08	4.91	4.70	5.80
33 34	4.33	• • • •	5.28	• • • •	73 74	3.89	4.69	4.45	5.49
35	4.38	•••	5 - 37		75	3.71	4.46	4.21	5.18 4.88
	4 - 44	• • • •	5.45	• • • •	75 76	3 · 53	4.23	3.99	•
36 37	4.50	• • •	5.54	• • • •	77	3.35	4.01	3.76	4 - 59
	4.56	• • • •	5.63	• • • • •	78	3.18	3 · 79	3 · 55	4.31
38 39		• • •	5.73	• • • •	79	3.01 2.84	3.58	3 · 34	4.04
	4.68	• • •	5.82	• • • •	80		3.37	3.13	3 - 77
40 41	4·75 4.81	• • • •	5.92	• • • •	81	2.67	3.17	2.92	3·53 3·30
42	4.88	• • • •	6.02	• • • •	82	2.51	2.98 2.80	2.73	3.30
43		• • • •	6.13	• • • •	83	2.35	2.63	2.54	2.87
44	4.95 5.02	• • • •	6.23	• • • • •	84	2.20	2.46	2.37	2.67
45	5.10	• • • •	6.33 6.44	• • • •	85	1.Q2	2.30	2.04	2.49
46	5.10	• • •	6.55	• • • •	86	1.70	2.14	1.00	2.30
47	5.24	• • •	6.65		87	1.65	1.00	1.75	2.13
48	5.32	• • • •	6.75		88	1.54	1.84	1.62	1.06
49	5.39	• • • •	6.85	• • • •	89	I.44	1.70	1.50	1.80
50	5.46	• • • •	6.95		90	1.33	1.57	1.38	1.65
51	5.53		7.03	:::	91	1.22	I.44	1.27	I.51
52	5.59		7.11		92	1.11	1.32	1.14	I.37
53	5.64		7.17	:::	93	.94	1.20	1.00	I.24
54	5.60		7.22		94	.90	1.08	.95	11.1
55	5.73		7.25		95	• • •	.96		.98
56	5.75		7.26		96		.83		. 8 4
57	5.76		7.25		97		.78	l l	. 79
58	5.76		7.22		98		.72		. 75
59	5.74		7.16		99		• • • •		• • •
								1	

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service and the number of pensioners on the roll as of June 30, 1914:

TABLE 140—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE.

Department of Street Cleaning Relief and Pension Fund

Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above
19	I	\$540	5,426	\$4,533,370	51	178	\$148,710	1,490	\$1,247,590
20			5,425	4,533,370	52	151	126,690	1,312	1,098,880
21	I	600	5,425	4,532,830	53	134	111,080	1,161	972,190
22	6	4,240	5,424	4,532,230	54	163	134,370	1,027	861,110
23	25	19,580	5,418	4,527,990	55	133	114,090	864	726,740
24	90	72,010	5,393	4,508,410	56	93	76,600	731	612,650
25	102	83,540	5,303	4,436,400	57	95	79,400	638	536,050
26	86	68,520	5,201	4,352,860	58	99	82,450	543	456,650
27	73	58,990	5,115	4,284,340	59	82	71,160	444	374,200
28	96	77,950		4,225,350	60	82	66,060	362	303,040
29	99	80,300	4,946	4,147,400	61	49	39,050	280	236,980
30	116	96,000	4,847	4,067,100	62	46	39,670	231	197,930
31	114	95,050	4,731	3,971,100	63	4I	34,730	185	158,260
32	129	108,220	4,617	3,876,050	64	41	37,320		123,530
33	112	91,940		3,767,830	65	29	23,630		86,210
34	113	93,040		3,675,890	66	21	17,170		62,580
35	156	126,590		3,582,850	67	13	10,760	53	45,410
36	143	115,670		3,456,260	68	10	8,660		34,650
37	153	130,160		3,340,590	69	10	8,880		25,990
38	182	154,000		3,210,430	70 71	6	4,750		17,110
39 40	178	155,980		3,056,430	72	I	780		12,360
41	163	134,570	3,451	2,900,450	73	4	3,500		11,580 8,080
42	176	146,570		2,765,880	74	I			7,320
43	205 162	140,760		2,619,310	75	3	2,749 780		4,580
44		185,000		2,438,220	76	1 1	1 '		3,800
45	223	170,540		2,297,460	77		1,040	4	3,800
46	168	140,160		1,941,830	78	1 -	1,040		2,760
47	165	138,760		1,801,670	79		780	3 3	2,760
48	152	127,790		1,662,910	80	1 *	1 /~	3 2	1,980
49	155	128,340		1,535,120	81	1	1,200		1,980
50	188	159,190		1,406,780	82	i	780		780
	100	139,190	2,070	1,400,700	02	1	1 /00	Ί	/"

TABLE 141—NUMBER AND SALARIES OF ACTIVE MEMBERS CLASSIFIED BY LENGTH OF SERVICE WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES, WHO HAVE HAD THE INDICATED SERVICE OR MORE

Department	of Street	Cleaning	Relief	and Pa	neion Rund
Determination	UI GUEEL		REIEI		

Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	86	\$68,740	5,426	\$4,533,370	16	167	\$145,680	910	\$831,010
1	135	111,420	5,340	4,464,630	17	120	104,710	743	685,330
2	420	336,190	5,205	4,353,210	18	177	151,850	623	580,620
3	797	640,100	4,785	4,017,020	19	184	173,050	446	428,770
4	276	219,720	3,988	3,376,920	20	84	86,630	262	255,720
5	362	288,130	3,712	3,157,200	21	52	49,200	178	169 ,090
6	118	96,120	3,350	2,869,070	22	61	53,060	126	119,890
7	389	312,330	3,232	2,772,950	23	13	12,340	65	66,830
8	293	239,560	2,843	2,460,620	24	13	16,250	52	54,490
9	313	252,680	2,550	2,221,060	25	15	14,550	39	38,240
10	282	230,550	2,237	1,968,380	26	5	4,690	24	23,690
11	211	173,190	1,955	1,737,830	27	4	5,120	19	19,000
12	183	151,790	1,744	1,564,640	28	4	3,960	15	13,880
13	116	98,790	1,561	1,412,850	29	I	1,250	11	9,920
14 15	134 401	124,020 359,030	1,445 1,311	1,314,060	30 & over	} 10	8,670	10	8,670

TABLE 142—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE

Department of Street Cleaning Relief and Pension Fund

Age	Number	Pensions	Age	Number	Pensions
35	I	\$400	63	8	\$3,120
36	I	390	64	19	8,190
37	••		65	19	7,960
38			66	14	5,660
39	I	300	67	19	7,680
40	3	1,180	68	19	7,960
41	3 3 5 2	2,050	69	11	4,950
42	5	2,170	70	10	6,030
43	2	850	71	9	4,100
44	1	600	72	7	2,720
45	3	1,840	73	4	1,560
46	4	2,070	74	2	770
47	3	1,530	75	5	2,120
48	4	3,170	76	••	İ
49	4	1,560	77		1,620
50	2	770	78	3 2	950
51	6	2,560	79	3	1,360
52	3	1,170	80		1
53	ő	2,550	81	1	390
54	7	2,770	82		1
55	4	1,560	83	I	390
56	8	3,210	84	••	
56 57	1 3 4 3 4 4 2 6 3 6 7 4 8 7 7	3,060	85	••	1
58	7	3,320	86		1
59	11	4,370	87		
60	15	5,860	88	I	390
61	7	2,710	11		·
62	25	10,260	Total	300	\$130,200

TABLE 143—NUMBER AND PENSIONS OF ALL SERVICE PENSIONERS CLASSIFIED BY AGE

Department of Street Cleaning Relief and Pension Fund

Age	Number	Pensions	Age	Number	Pensions
60	1	\$390	70	3	\$1,420
61	I	400	71		
62	2	780	72	2	810
63	2	1,000	73	2	1,160
64	I	390	74	1	390
65			75	1	390
66	3	2,550	76	I	450
67		• • •	11 1		
68	I	460]]		_
69			Total	21	\$10,590

TABLE 144—NUMBER AND PENSIONS OF ALL WIDOW PENSIONERS* CLASSIFIED BY AGE

Department of Street Cleaning Relief and Pension Fund-

Age	Number	Pensions	Age	Number	Pensions
28	I	\$300	58	3	\$600
29	I	200	59	4	800
30	1	300	60	ż	400
31	I	300	61	2	400
32	2	400	62	2	400
33			63		200
34	I	200	64	1 6	1,300
35		60 0	65	I	300
36	3 2	400	66		
37	2	400	67	I	200
38	2	500	68	ī	200
39	I	200	69	••	
40	2	500	70	••	
41	4	900	71	•••	
42	3	600	72	2	400
43	3 3 6	600	73	ī	200
44	6	1,200	74	ī	200
45		600	75	• • •	
46	3 2	400	76	•••	1
47	ī	200	77	• • • • • • • • • • • • • • • • • • • •	l
48		600	78	•••	1
49	3	800	79	••	
50	3 4 6	1,200	80	••	1
51	ŏ	1,200	81	••	1
52	3	700	82	••	
53	3	800	83	••	
54	4 6	1,200	84	• •	1
55	9	600	85	 I	200
56	3 3 2	600	65	<u> </u>	200
57	3	400	Total	100	\$22,700

^{*}Includes 3 dependent parent pensioners.

TABLE 145—NUMBER AND PENSIONS OF ALL CHILDREN PENSIONERS CLASSIFIED BY AGE

Department of Street Cleaning Relief and Pension Fund

Age	Number	Pensions	Age	Number '	Pensions
15	4	\$200	18	3	210
16 17	••		Totals	7	\$410

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets Fund as of June 30, 1914, and shows the complete financial condition of the

TABLE 146—A VALUATION OF ASSETS AND LIABILITIES OF PENSION FUND—VALUED

Liabilities	
Item	Present Value of Payments to be Made
Pensions to 437 Pensioners now on the pension roll of the fund, as follows:	
Service Pensioners: 21 Annual pensions aggregating	\$62,228
Disability Pensioners: 300 Annual pensions aggregating	654,468
Widow Pensioners: 106 Annual pensions aggregating	280,175
7 Annual pensioners: Dependent Parent Pensioners: 7 Annual pensions aggregating	669
3 Annual pensions aggregating 600	4,198
Total Pensions Entered Upon	\$1,001,738
Pensions to Dependents of present pensioners:	
Widows' Pensions: Widows of Service Pensioners	\$16,01
Widows of Disability Pensioners	
Children of Service Pensioners	16
Children of Disability Pensioners	
Total Prospective Pensions to Dependents of Present Pensioners	\$365,71
Pensions to such Employees as will retire from the present force of 5,426 employees:	
Service Pensions	\$837,53
Actual Performance of Duty during first 10 years of service All Causes after 10 years' service	
Total Prospective Pensions to Employees	\$4,197,67
Pensions to Dependents of such employees of the present active force as will die in service, or while on pension:	3
Widows' Pensions: Widows of employees who will die in Actual Performance of	1
Duty	\$272.86
10 years' service	991,57
Widows of employees who will die as Service Pensioners Widows of employees who will die as Disability Pensioners	
Children's Pensions: Children of employees who will die in Actual Performance of	1
Duty	0.28
ro years' service	. 46,17
Children of employees who will die as Disability Pensioners Chependent Parents' Pensions	2,94 45,47 83,47
Total Prospective Pensions to Dependents of Employees in Service	
Total Pensions Not Entered Upon	
Grand Total	

\$9,010,170

and liabilities of the Department of Street Cleaning Relief and Pension fund as of that date:

THE DEPARTMENT OF STREET CLEANING RELIEF AND AS OF JUNE 30, 1914

ASSETS	
Item	Present Value of Payments to be Received
Funds in hand	\$838,769 1,316,533 6,854,876

^{*}Note—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$3,510,800.

sioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners. The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pen-

TABLE 147—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Department of Street Cleaning Relief and Pension Fund	

Total	\$3,039	2,727	2,439	2,173	1,929	1,705	1,498	1,313	1,146	994	858	739	633	538	454	381	315	259	212	171	137	8	S	99	So	37	27	19	13	o.	ĸ	•	-	•	-	\$1.4 to, for y
Pensions to Dependent Parents	2	-	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	-		· 	5 4,0 m
Pensions to Children	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:			· · · · ·
Pensions to Widows	\$2,087	2,690	2,413	2,155	1,917	1,697	1,495	1,311	1,145	966	858	739	632	538	454	381	315	259	212	171	137	100	82	99	20	37	27	61	13	0	S	8	-		 !	\$150,103
Service Pensions	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:			\$70,146
Disability Pensions	\$50	36	92	81	12	•	8	7	H	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:			KHOO, 874
*Date	1050	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	9961	1961	1968	1969	1970	161	1972	1973	1974	1975	9261	1977	1978	1979	1980	1981	1982			
Year After Valuation	36	37	38	36	4	41	42	43	4	45	46	47	84	49	20	51	25	53	2 2	22	20	57	28	20	8	61	62	છ	4	65	99	67	89			Total
Total	\$153,326	135,044	119,202	105,014	92,645	81,773	72,077	63,571	56,015	49,409	43,527	38,404	33,902	20,002	26,567	23,709	21,025	18,790	16,854	15,156	13,698	12,413	11,280	10,279	9,382	8,577	7,850	7,187	6,574	010'9	5,487	5,001	4,545	4.127	3,738	3.373
Pensions to Dependent Parents	\$573	525	479	436	396	359	324	202	263	235	200	185	165	148	133	120	101	96	85	75	99	57	49	42	36	31	27	23	61	91	13	11	x 0 ·	9		
Pensions to Children	\$305	661	861	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
Pensions to Widows	\$21,850	21,242	20,734	20,174	19,61	19,046	18,477	17,904	17,327	16,746	191'91	15,574	14,984	14,393	13,801	13,208	12,618	12,030	11,445	10,865	10,292	9,726	691'6	8,622	8,088	7,567	2,062	6,572	960,9	5,642	5,203	4,782	4,381	1,001	3,042	
Service Pensions	\$10,047	1/0'6	8,143	7,266	6,440	8,669	4,953	4,298	3,693	3,147	2,658	2,223	1,842	1,502	1,223	978	773	109	460	336	256	981	131	92	19	40	56	91	0	v	"	H	:	:	: :	
Disability Pensions	\$120,551	104,007	89,648	77,138	66,197	56,699	48,323	41,077	34,733	29,281	24,499	20,422	116,91	13,949	11,410	9,403	7,528	6,063	4,864	3,880	3,084	2,444	1,931	1,523	1,197	939	735	276	448	347	500	207	150	120	89	*Date year beginning July 1st.
*Date	1914		9161	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1661	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1940	7401	1040	ear begir
Year After Valuation	0	-	7	m	4	S	9	7	~	o ;	01	=	12	13	14	15	91	17	8 2	19	200	21	77	23	47.	52	9 5	27	58	- 53	9	3,2	3 6		35	*Date y

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSION TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Department of Street Cleaning, expressed as a percentage of the employee's salary: TABLE 148—BATES OF CONTRIBITION EXPRESSED AS DEPORTAGES OF SALABLES NECESSARY TO DAY BOD

TABLE 148—RATES OF CONTRIBUTION, THE VARIOUS PENSION BENEFITS FUND	ILE 148—RATE THE VARIOUS FUND	KATE	S OF CONT	ONTR ION E	RIBUTION, BENEFITS	ON, E	EXPRESSE OF THE D	DEPARTMENT	PERCE	T OF	EXPRESSED AS PERCENTAGES OF SALARIES, NECESSARY TO OF THE DEPARTMENT OF STREET CLEANING RELIEF AND	CLEA	ALARIES, NE CLEANING	SCESSAR	SARY TO EF AND		PAY FOR PENSION
			PENS	PENSION TO EMPI	MPLOYEES		Ā	PENSION TO WIDOWS OF	Winows o	,	Pansic	PENSION TO CHILDREN OF	LDREN OF		PENSIO!	Pension to Dependent Parents of	NDENT
				Disabi	ability Pension	nsion		Actives	Actives Dying			Actives	Actives Dying			Actives Dying	Dying
AGE AT ENTRANCE	Total	Total	Series Series	Total	In Per- formance of Duty	All	Total	å	Not in Per- formance	Pension- ers	Total	7 0 9	Not in Per- formance	Pension-	Total	7	Not in Per- formance
			normal		With Service of Less than	After 10 Years of			After 10 Years of Service			formance of Duty	After 10 Years of Service			formance of Duty	After 10 Years of Service
			Ξ	(2)+(3)		Service (3)	(4)+(5)+(6)	3	(3)	(9)	(2)+(8)+(4)	(2)	(8)	(6)	(11)+(01)	(or)	(II)
20	4.19	H	.17	1.28	10.	1.27	2.27	.31	1.10	98.	.13	.02	.07	9.	.34	.04	.30
21	4.49		6I .	1.39	ю.	1.38	2.41	.34	1.14	.93	41.	.02	80.	.04	.36	.04	.32
77	4.79	ij	ç.	1.50	٠.	1.49	2.56	.37	1.18	10.1	41.	.02	%;	40.	.39	.05	.34
3 6	S. 6	i.	. 22	1.62	<u>.</u>	1.61	2.71	÷	1.21	1.10	41.	.03	89	<u>\$</u>	.40	S.	.35
2 6 2 4	S. 38		4 ×	1.73	9 8	1.72	2.85	<u>*</u>	1. 24	2.18	21.	ö. 8	8,8	Š, S	.4I	Ş, ç	٠ و د
8	5.97		2 %	1.99	5 6	1.07	3.14	4.	1.20	1.36	91.	. 6.	88	. <u></u>	.30	5 6	 4.
22	6.26		.31	2.13	.03	2.10	3.28	. 52	1.30	1.46	91.	.03	.07	9,	.38	so.	.33
9 6	0.54 54	_	.34	2.27	.03	2.24	3.42	.55	1.32	1.55	9 <u>1</u> .	.03	.07	8,	.35	40.	.31
3 6	0.83		.37	2.43	40.	2.38	3.54	.57	1.32	1.05	91.		.07	8,	.33	8	. 29
3 5	7.10		6 5	2.57	ģ 5	. 53	3.00	6,7	1.33	1.74	91.		6.6	8,6	.31	<u> </u>	72.
32	7.64		54.	.80	ĕ	2.84	3.85	. 62	1.31	1.02	91	6	6.	8	. 27	8	42.
33	7.95		.SI	3.06	.o.	3.01	3.96	.64	1.31	2.01	91.	.03	%	.07	. 26	. s.	. 23
*	8.25		.56	3.23	8	3.17	4.04	S	1.29	2.10	91.	.03	%	.07	. 26	ق	. 23
35	8.55	_	19.	3.41	90.	3.35	4.12	99.	1.27	2.19	.15	.03	so.	0	. 26	.03	. 23
9	×. 88	-	9 9 -	3.61	.07	3.54	4.20	.67	1.25	2.28	. 15	9	.05	.07	. 26		. 23
7 6	9.21		.72	3.80	.07	3.73	4.27	86.	I.22	2.37	.15		So.	0.	.27		. 24
9 6	9.50		62.6	8	.07	3.93	4.35	8	1.20	2.47	.15	ق	so.	· 6		်	. 24
) (9.92	_	.87	4.21	.07	4. I4	4.43	8,	1.17	2.57	.13	.02	S	8,	200	9	- 24
2	10.29	.	- 36	4.43	. 07	4.30	4.50	60.	I.I4	2.07	. 13	.02	- 50.	00.	. 25	.04	. 24

SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Supreme Court, First Department, Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

- (1) Upon application after 25 years' service in state, county or city of New York, the last 12½ years of which have been in positions covered by the act, a pension of one-half of average of last two years' salary.
 - In the discretion of the court, after 20 years' service, provided the last ten years of it have been in positions covered by this act, a pension of one-fiftieth of average of last two years' salary for each year of service.
- (2) Upon disability occurring after 20 years' service in state, county or city of New York, the last ten years of which have been in positions covered by the act, a pension of not more than one-half of average of last two years' salary.

The average allowance has been 50 per cent. of average last two years' salary.

Contributions

By EMPLOYEES

One percentum of salary.

By CITY

Indirect contributions:

Unexpended balances of salary appropriations.

Direct contributions:

Budgetary appropriation as required to pay maturing pensions.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death

Rate of service retirement

Rate of disability retirement

Rate of change of salary

Rate of death of service pensioners

Rate of death of disability pensioners

BASIC DATA AND THEIR DEVELOPMENT

Schedules included

The pension fund of the Supreme Court, First Department, covers all employees in the Supreme Court, First Department and certain divisions of the County Clerk's office which handle records of the Supreme Court, First Department, who contribute toward the fund. Contribution toward the fund is now compulsory on entrants into the positions covered by the law, although employees in the service in 1914 were given the option of becoming members.

In making the valuation the schedules for the employees were divided so that only the schedules for contributors were carried in the valuation for the Supreme Court, First Department, while the remainder were placed in the various classes of the City of New York Employees' Retirement Fund. The schedules used as a basis for the experience tables were, however, somewhat different from those considered in the valuation, as will be shown in the discussion which follows.

Special methods of handling data

As the law establishing the Supreme Court pension fund was not in operation during the entire period for which service experience was obtained by the Commission, the tabulation could not be used as a basis for developing rates of retirement or considered as indicative of such rates, unless modified to account for the probable experience had the law been in force during the entire period under observation. Since the experience was valuable mainly in deriving other service rates which could equally well be based on data for all the employees in this department, and since the experience based on contributors alone was very meagre, it seemed advisable to include all employees in the departments in the experience used as a basis for the required rates. Even with this combination the basis was of limited extent.

The Second Department of the Supreme Court has a pension fund for its employees and although all employees of the divisions covered by it are members of the fund, its experience was even smaller than that of the fund in the First Department. Since the type of the personnel and the duties and salaries of the members are about the same in the two departments, it seemed advisable to combine the experience of the two funds and use the combined data as a basis for certain rates to be applied to both funds. In making this combination the cards for employees in the county clerk's office were excluded in order that the experience might not include any persons who were not employed in the courts. The combined experience was used as a basis for developing a withdrawal rate and a death rate, whereas the experience of each of the two departments was considered separately in selecting the other rates to be used, which were adopted rates and not rates developed from the actual experience.

The tabulations used as a basis for salary scales were also combined. The reasons for this combination are given in the discussion of the salary scale. With these exceptions the general methods of handling the data were the same as those outlined in section I of this report.

The following summaries give the entire experience which was available for consideration in preparing the rates for both funds:

TABLE 149—SUMMARY OF EXPOSURE AND SEPARATIONS—ACTIVE SERVICE

Supreme Court, First Department, Retirement Fund

Supreme Court, First Department, Retrement Fund	
Number Exposed to Risk	1,328.
Total Number of Separations	50
Total Withdrawals	6
Resignations	6
Dismissals	
Total Deaths	35
Total Separations by Disability	9
Total Service Retirements	• •
Supreme Court, Second Department, Retirement Fund	
Number Exposed to Risk	630
Total Number of Separations	18
Total Withdrawals	
Resignations	• •
Dismissals	
Total Deaths	17
Total Separations by Disability	i
Supreme Court, First and Second Department, Retirement Funds—Con	nbined
Number Exposed to Risk	1,958.5
Total Number of Separations	68
Total Withdrawals	6
Resignations	6
Dismissals	
Total Deaths	52
Total Separations by Disability	10
Total Service Retirements	Ţ

TABLE 150—SUMMARY OF EXPOSURE—SALARY

Supreme Court, First Department, Retirement Fund

Class	Number of Annual Salaries	Total Payroll
Active Members		\$2,263,700 63,600
Total	1,026	\$2,327,300

Supreme Court, Second Department, Retirement Fund

Class	Number of Annual Salaries	Total Payroll
Active Members	516 · · ·	\$1,162,600 · · ·
Total	516	\$1,162,600

Supreme Court, First and Second Department, Retirement Funds-Combined

Class	Number of Annual Salaries	Total Payroll
Active Members	1,513	\$3,426,300 63,600
Total	1,542	\$3,489,900

RATES AND COMPARISONS

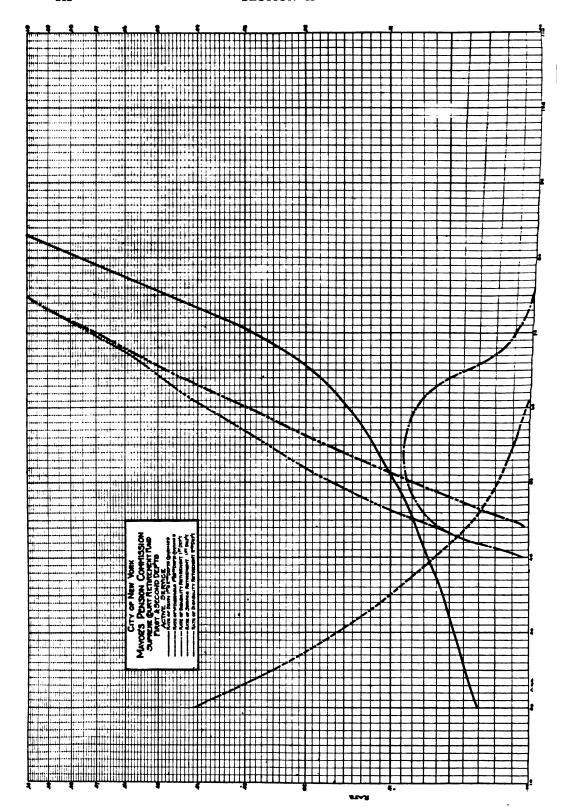
In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, a diagram is given on page 282, showing the rates plotted on cross section paper.

TABLE 151—RATES OF SEPARATION FROM ACTIVE SERVICE
Supreme Court, First Department, Retirement Fund

Age	Rate of With- drawal	Rate of Death	Rate of Disability Retire- ment	Rate of Service Retire- ment	Age	Rate of With- drawal	Rate of Death	Rate of Disability Retire- ment	Rate of Service Retire- ment
Age	$^{w}q_{x}^{(a)}$	$^{d}q_{x}^{(a)}$	$q_x^{(a)}$	$^{o_r}q_x^{(a)}$		$q_x^{(a)}$	$^{d}q_{x}^{(a)}$	$q_x^{(a)}$	or q (a)
20	.0402	.0031	! l		56	.0007	.0122	.0086	.0108
21	.0366	.0033	l l		57	.0006	.0127	.0085	.0220
22	.0331	.0034			58	.0004	.0133	.0083	.0247
23	.0302	.0036	l		59	.0003	.0139	.0080	.0271
24	.0273	.0037			60	.0002	.0146	.0077	.0301
25	.0248	.0039			61	1000.	.0153	.0072	.0333
26	.0227	.0040			62		.0162	.0067	. 0368
27	.0207	.0042			63		.0171	.0060	. 0400
28	.0188	.0044			64)]	.0181	.0051	. 0439
29	.0172	.0045			65		.0192	.0040	. 0477
30	.0157	.0047	} ···	• • •	66	•••	.0205	.0029	.0519
31	.0142	.0049	ł ···	• • •	67		.0220	.0022	. 0561
32	.0130	.0050		• • • •	68	•••	.0239	.0017	. 0609
33	.0120	.0052		• • •	69	• • • •	.0260	.0013	. 0659
34	.0109	.0054	•••	• • •	70	• • • •	.0285	.0010	.0710
35	.0100	.0056	l	• • •	71 72	• • • •	.0315	.0007	.0770
36 37	.0001	.0058	l ···	• • •	73	• • • •	.0350	.0005	. 0830
37 38	.0083	.0060		• • •	74	• • • •	.0385	.0004	. 0895
38 39	.0075	.0062		•••	75	•••	.0426	.0002	.0965
39 40	.0068	.0064		• • •	76	• • • • •	.0473	1000.	. 1040
41		.0007	.0005	• • •	77	• • • •	.0525		.1125
42	.0054	.0009	.0018	•••	78	• • • •	.0578	• • • •	.1215
43	.0048	.0071	.0030	•••	79	• • • •	.0606	• • • • •	. 1310
44	.0043	.0074	.0049	.0003	80	• • • •	.0763		. 1420
45	.0036	.0070	.0058	.0014	81	• • • •	.0835	:::	. 1543
46	.0030	.0079	.0071	.0014	82	• • • •	.0035	:::	.1830
47	.0030	.0085	.0075	.0038	83		.1000	:::	. 2010
48	.0023	.0088	.0070	.0050	84		.1005	:::	. 2225
49	.0021	.0002	.0082	.0066	85		.1193	1 :::	. 2400
50	8100.	.0005	.0084	.0080	86	1	.1293	l	. 2850
51	.0016	.0000	.0086	.0008	87		.1399	:::	.3375
52	.0014	.0103	.0087	.0113	88	:::	.1510	:::	.4250
53	.0012	.0107	.0088	.0132	89		. 1623		. 5000
54	.0010	.0112	.0088	.0151	90		.1735		. 8265
55	.0000	.0116	.0087	.0172					
	<u> </u>	1	<u> </u>		<u> </u>		<u> </u>	1	·



RATES OF RESIGNATION AND DISMISSAL

A single rate of withdrawal, which includes both resignations and dismissals, was prepared for the Supreme Court, First Department, Retirement Fund. This rate is the lowest rate developed for any branch of the city services with the single exception of the Fire Department. The next higher rate is that applicable to the pension fund of the Police Department. A low rate in such a department as the Supreme Court would seem entirely reasonable and no explanation of the rate beyond the general nature of the department appears necessary.

RATE OF DEATH

The rate of death among members of the active service of the Supreme Court, First Department, Retirement Fund is lower than the corresponding rates in other city services with the exception of the teaching services, represented by the men and women under the Board of Education and the City College. In view of the nature of the service and the general type of the average member of the active service, the rate appears to be such a one as might have been anticipated for this service.

RATE OF DISABILITY

The rate of disability for the Supreme Court, First Department, Retirement Fund, is an adopted rate which, considered as a whole, ranks about seventh among the ten rates prepared. The only rates which are lower are those for clerks under the City of New York Employees' Retirement Fund, members of the Health Department Pension Fund, and men teachers in the Teachers' Retirement Fund. The rate of disability as shown increases rapidly from age 40 to 45 and after réaching the maximum between 45 and 55 begins slowly to decrease. This may be explained by the conditions of retirement, as persons above 55 years of age will ordinarily be retired as service pensioners.

RATE OF SERVICE RETIREMENT

The rate of service retirement is an adopted rate, slightly higher than the corresponding rate for men teachers and lower than similar rates for firemen, policemen, women teachers, and members of the Health Department and Supreme Court, Second Department, funds. This rate, although not very high, is believed to be a conservative rate for the valuation of the pension provisions.

RATE OF SALARY CHANGE

The rate of salary change in the Supreme Court, First Department, and in the Supreme Court, Second Department, were developed separately, but on comparison were found to resemble each other closely. The increases were about the same in extent and were similarly distributed according to the age of the employees. In view of this fact it was considered unnecessary to prepare separate scales for the two departments, consequently a single scale was prepared based on the combined data of the two funds.

The figures necessary to show the probable changes in salary were secured directly by graduating the average salaries in the manner described

on page 31. For comparative purposes rates of salary change were computed, although not used in the valuation. They are presented with a brief discussion on page 387.

Pensioners

As no mortality table could be based on the insufficient experience of the pensioners of the Supreme Court, First Department, Retirement Fund, McClintock's annuitants' mortality rate for men was adopted for service pensioners, and Arthur Hunter's mortality rate among disabled lives was adopted for disability pensioners. The former rate has been adopted by the Insurance Department of New York as its standard, while the latter rate is often used by insurance companies in their valuations based on disabled lives. The following are McClintock's and Hunter's rates which were used in the valuation of the fund. A diagram showing the rates of mortality plotted on cross section paper is given on page 285.

TABLE 152—RATES OF MORTALITY AMONG PENSIONERS
Supreme Court, First Department, Retirement Fund

\ge	Disability	Service	Age	Disability	Service
40	.0850	.0106	66	. 1150	.0421
41	.0850	.0100	67	.1150	. 0454
42	.0850	.0112	68	.1150	. 0490
43	.0860	.0116	69	.1150	.0529
44	.0860	.0120	70	.1150	.0572
45	.0870	.0125	71	.1160	. 0619
46	.0880	.0120	72	.1160	. 0670
47	.0880	.0135	73	.1160	. 0726
48	. 0890	.0141	74	. 1170	. 0786
49	.0000	.0147	75	.1180	. 0852
50	.0010	.0154	76	. 1190	. 0924
51	.0020	.0162	77	.1210	. 1002
52	.0040	.0170	78	. 1260	. 1087
53	.0060	. 0180	79	. 1330	. 1179
54	.0000	.0190	80	. 1445	. 1279
55	. 1010	.0201	81	. 1586	. 1387
56	. 1030	.0213	82	. 1743	. 1505
57	.1050	.0227	83	. 1916	. 1631
58	. 1070	.0241	84	. 2114	. 1768
59	. 1000	. 0258	85	. 2356	. 1915
50	.1110	.0275	86	. 2657	. 2074
51	.1130	. 0294	87	. 3030	. 2244
52	.1140	.0315	88	. 3467	. 2426
53	.1140	. 0338	89	. 3959	. 2621
54	.1150	. 0364	90	·4545	. 2830
55	.1150	.0391			• • •

ERVICE AND MORTALITY TABLES AND SALARY SCALE The following tables are based on the rates discussed above:

TABLE 153-ACTIVE SERVICE TABLE AND SALARY SCALE

Supreme Court, First Department, Retirement Fund

				RETIREMENTS	MENTS							RETIREMENTS	MENTS		
AGE	Living	drawals	Deaths	Disability	Service	Total Decrement	Scale	АСВ	Living	drawale	Deaths	Disability	Service	Total Decrement	Scale
	€_,*	ê ,	€ <u>,</u> ,,				,,		9_,	ĝ,	9,4	ē,"			,,*
20	1,000,000	40,200	3,100	:	:	43,300	1,365	26	418,336	297	5,083	3,606	8,283	17,269	2,300
21	956,700	35,015	3,109	:	:	38,124	1,432	57	401,067	220	\$,086	3,401	8,823	17,539	2,290
22	918,576	30,405	3,123	:	:	33,528	1,500	28	383,528	191	2,007	3,172	9,473	17,903	2,280
33	885,048	26,728	3,160	:	:	29,888	1,575	29	365,625	110	5,079	2,925	800.6	18,022	2,270
*	855,160	23,346	3,173	:	:	26,519	1,646	8	347,603	63	5,072	2,658	10,463	18,256	2,260
25	828,641	20,550	3,215	:	:	23,765	1,719	19	329,347	23	5,039	2,372	10,067	18,401	2,255
5 0	804,876	18,270	3,236	:	:	21,506	1,789	62	310,046	:	5,022	2,077	11,443	18,542	2,240
27	783,370	16,216	3,282	:	:	19,498	1,854	ន	292,404	:	4,986	1,754	11,696	18,436	2,235
8 8	763,872	14,384	3,323	:	:	17,707	1,920	Z	273,968	:	4,945	1,389	12,027	18,361	2,225
53	746,165	12,797	3,373	:	:	16,170	1,978	65	255,607	:	4,908	1,015	12,192	18,115	2,220
9	729,995	11,424	3,424	:	:	14,848	2,035	8	237,492	:	4,868	689	12,326	17,883	2,210
31	715,147	10,177	3,490	:	:	13,667	2,090	29	219,600	:	4,831	477	12,320	17,628	2,200
32	701,480	9,133	3,536	:	:	12,669	2,140	89	186,102	:	4,827	335	12,301	17,463	2,190
33	118,889	8,238	3,596	:	:	11,834	2,185	9	184,518	:	4.797	236	12,160	17,193	2,180
34	676,977	7,393	3,662	:	:	11,055	2,225	2	167,325	:	4,769	167	11,880	16,816	2,170
35	665,922	6,633	3,736	:	:	10,369	2,265	7	150,509	:	4,741	011	11,589	16,440	2,165
36	655,553	2,966	3,802	:	:	6,768	2,295	72	134,069	:	4,692	71	11,128	15,891	2,160
37	645,785	5,341	3,875	:	:	9,216	2,320	73	118,178	:	4,550	45	10,577	15,172	2,150
88	636,569	4,762	3,959	:	:	8,721	2,340	7	103,006	:	4,388	77	0,040	14,352	2,140
30	627,848	4,238	4,043	 :	:	8,281	2,350	75	88,654	:	4,189	11	9,220	13,420	2,130
2	619,507	3,748	4,139	279	:	8,166	2,360	92	75,234	:	3,950	:	8,404	12,414	2,120
4	611,401	3,320	4,219	1,113	:	8,652	2,365	11	62,820	:	3,628	:	7,633	11,261	2,110
7	002,749	2,917	4,304	2,170	:	9,391	2,370	78	51,559	:	3,274	:	0,754	10,028	2,085
Ţ:	593,358	2,540	4,415	2,925	:	0,880	2,375	2	41,531	:	2,888	:	5,898	8,780	2,070
4 4	583,478	2,217	4,461	3,402	175	10,275	2,375	8	32,745	:	2,497	:	5,052	7.549	2,000
2 4	5/3,403	1,937	4,540	3,720	200	110'11	2,375	5 6	25,190	:	2,104	:	4,44	4800	2,040
? \$	502,192	4/0,1	4,010	3,992	1,402	11,744	2,370	70	18,872	:	1,727	:	3,453	5,100	2,025
? ?	550,440	1,459	4,004	4:134	2,002	12,309	2,305	2	13,092	:	1,309	:	2,752	4,121	2,010
9 9	530,079	1,254	4,751	4,251	2,090	12,940	2,300	\$	9,571	:	1,048	:	2,130	3,178	1,989
2	523,133	0001	4,015	4,290	3,400	13,075	2,355	82	6,393	:	763	:	1,592	2,355	0/6'1
2	511,450	930	4,859	4,30I	4,092	14,188	2,350	98	4,038	:	522	:	1,151	1,673	1,945
2 2	497,270	790	4,918		4,873	14,864	2,340	87	2,365	:	331	:	798	1,129	1,020
4 6	402,400	075	4,004		5,451	15,287	2,335	8	1,236	:	187	:	525	713	1,805
3 3	407,119	201	4,998		0,160	15,812	1,330	8	524	:	500	:	300	304	1,865
55	435,042	370	5,032	3.780	7.483	16,706	3,320	8	130	:			101	÷	1,440

TABLE 154—DISABILITY PENSIONERS' MORTALITY TABLE
Supreme Court, First Department, Retirement Fund

Age	Living $l_{x}^{(i)}$	Dying $d_{x}^{(i)}$	Age	Living $l_x^{(i)}$	Dying $d_x^{(0)}$
40	1,712	146	66	117	13
41	1,566	133	67	104	12
42	1,433	122	68	92	11
43	1,311	113	69	Šī Š	Q
44	1,198	103	70	72	9 8
45	1,095		71	64	
46	1,000	95 88	72	57	7 7 6
47	912	8o	73	50	6
48	832	74	74	44	5
49	758	68	75	39	5
50	690	63	76	34	4
51	627	63 58	77	30	À
52	569	53	78	26	3
53	516	50	79	23	3
54	466	46	80	20	4 3 3 3 3 2
55	420	42	81	17	3
56	378		82	14	2
57	339	39 36	83	12	2
58	303	32	84	10	2
59	271	30	85	8	2
60	241	27	86	8 6	2
61	214	24	87		1
62	190	22	88	3	I
63	168	19	89	4 3 2	I
64	149	17	90	Ī	1
65	132	15			l <u>.</u>

TABLE 155—SERVICE PENSIONERS' MORTALITY TABLE
Supreme Court, First Department, Retirement Fund

Age	Living $l^{(p)}$	Dying $d_{z}^{(p)}$	Age	Living $l_x^{(p)}$	Dying $d^{(p)}_{z}$
40	776,753	8,206	73	311,480	22,600
41	768,547	8,358	74	288,880	22,710
42	760,189	8,526	75	266,170	22,682
43	751,663	8,710	76	243,488	22,498
44	742,953	8,913	77	220,000	22,145
45	734,040	9,135	78	198,845	21,613
46	724,905	9,378	79	177,232	20,898
47	715,527	9,641	80	156,334	19,995
48	705,886	9,927	81	136,339	18,914
49	695,959	10,238	82	117,425	17,666
50	685,721	10,572	83	99,759	16,271
51	675,149	10,934	84	83,488	14,759
52	664,215	11,320	85	68,729	13,162
53	652,895	11,736	86	55,567	11,523
54	641,159	12,170	87	44,044	9,882
55	628,980	12,649	88	34,162	8,289
56	616,331	13,150	89	25,873	6,782
57	603,181	13,677	90	19,091	5,402
58	589,504	14,231	91	13,689	4,177
59	575,273	14,812	92	9,512	3,125
60	560,461	15,415	93	6,387	2,258
61	545,046	16,040	94	4,129	1,568
62	529,006	16,681	95	2,561	1,043
63	512,325	17,335	96	1,518	661
64	494,990	17,995	97	857	400
65	476,995	18,654	98	457	227
66	458,341	19,305	99	230	122
67	439,036	19,936	100	108	6 o
68	419,100	20,537	101	48	29
69	398,563	21,095	102	19	12
70	377,468	21,597	103	7	5
71	355,871	22,026	104	2	I
72	333,845	22,365	105	1	I

14,866

40

PRESENT VALUES OF BENEFITS AND CONTRIBUTIONS

The present values of the benefits were developed from the preceding service and mortality tables. The following table shows the present value of total salary to be earned during active service on a basis of entrance salary of \$1,000, and the present value of a pension of final salary in terms of an entrance salary of \$1,000 upon event of the various conditions upon which pensions are payable, as given in the enumeration of benefits.

TABLE 156—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS AND THE PRESENT VALUES OF THE PENSION BENEFITS PAYABLE TO THESE MEMBERS BASED ON AN ENTRANCE **SALARY OF \$1,000**

ļ	Total	Total	PENSION TO	MEMBERS
Age at Entrance	Future *Salary	of All Pension Benefits	Upon Service Retirement	Upon Disability Retiremen
20	\$21,333	\$556	\$422	\$134
25	19,567	617	490	127
30	17,576	638	548	90
35	15.043	640	505	5.4

Supreme Court, First Department, Retirement Fund

628

The expectations of life and the present values of a pension of one to pensioners are shown in the following tables:

TABLE 157—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO DISABILITY PENSIONERS Supreme Court, First Department, Retirement Fund

Annuity Value Expectation of Life Annuity Value Expectation of Life Age Age 40 65 10.26 5.99 7.55 7.49 41 10.17 66 5.94 7.45 7.45 5.87 42 7.40 10.07 67 7.32 5.81 43 68 9.96 7.34 7.21 44 69 7.12 7.29 9.85 5.77 5.67 45 9 · 73 70 6.94 7.22 46 71 6.75 7.16 9.61 5 - 55 72 47 9.48 6.52 7.09 5.40 48 7.01 73 5.31 6.36 9.35 74 6.16 49 6.93 9.21 5.17 50 $6.8\tilde{5}$ 9.07 8.93 75 4.99 5.88 51 76 4.84 5.68 6.77 52 6.68 77 4.64 8.79 5.37 8.64 53 6.59 78 4.46 5.12 54 8.52 79 6.52 4.14 4.72 55 3.86 6.44 8.39 80 4.35 3.61 56 6.37 8.27 81 4.03 57 8.16 82 6.30 3.45 3.79 58 8.07 83 3.00 6.25 3.33 59 6.19 84 2.72 7.97 2.90 60 6.15 7.90 85 2.33 2.50 61 7.83 86 1.08 6.12 2.17 1.96 62 6.08 87 7.76 2.00 63 6.07 7.71 88 1.40 1.50 6.03 7.63 89 64 1.00 1.00

⁶⁵³ *Total future salary estimated without use of **Total future salary esti pension only.

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TABLE 158—ANNUITY VALUES AND EXPECTATIONS OF LIFE APPLICABLE TO SERVICE PENSIONERS

Supreme Court, First Department, Retirement Fund

Age	Annuity Value	Expectation of Life	Age	Annuity Value	Expectation of Life
40	15.80	28.08	70	7.24	9.18
41	15.58	27.37	71	6.93	8.71
42	15.36	26.67	72	6.63	8.25
43	15.13	25.96	73	6.34	7.81
44	14.89	25.26	74	6.04	7.38
45	14.65	24.56	75	5.76	6.97
46	14.40	23.87	76	5.48	6.57
47	14.15	23.17	77	5.20	6.19
48	13.89	22.48	78	4.94	5.82
49	13.62	21.80	79	4.68	5.47
50	13.35	21.11	80	4.43	5.13
51	13.07	20.44	81	4.18	4.81
52	12.79	19.76	82	3.95	4.50
53	12.50	19.10	83	3.72	4.21
54	12.21	18.44	84	3.50	3.94
55	11.91	17.79	85	3.29	3.68
56	11.62	17.14	86	3.00	3.43
57	11.31	16.50	87	2.90	3.19
58	11.01	15.88	88	2.71	2.97
59	10.70	15.26	89	2.54	2.77
60	10.38	14.65	90	2.37	2.57
61	10.07	14.05	91	2.22	2.39
62	9.75	13.46	92	2.07	2.22
63	9.44	12.88	93	1.93	2.06
64	9.12	12.31	94	1.8o	1.91
65	8.80	11.76	95	1.67	1.77
66	8.49	11.22	96	1.56	1.64
67	8.17	10.69	97	1.45	1.52
68	7.86	10.17	98	1.35	1.41
69	7.55	9.67	99	1.25	1.30

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number and salaries of employees, by age and length of service, and the number and pensions of pensioners by age on the roll as of June 30, 1914:

TABLE 159—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS, SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Supreme Court, First Department, Retirement Fund

Age	Number	Salarice	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above
23	1	\$1,800	204	\$673,550	53	6	\$14,400	114	\$259,300
24	l l	• • • •	293	671,750	54	7	16,900	108	244,900
25	1	1,400	293	671,750	55	15	27,200	101	228,000
26	1	1,800	292	670,350	56	Š į	20,500	86	200,800
27	1	1,800	291	668,550	57	9	26,400	78	180,300
28	6	11,400	200	666,750	58	ģ	17,300	6g	153,000
29	1 1	1,500	284	655,350	59	8	16,600	6ó	136,600
30	3	6,100	283	653,850	60	2	5,800	52	120,000
31	3 6	7,800	280	647,750	61	5	12,300	50	114,200
32	6	13,300	277	639,950	62	6	13,200	45	101,900
33	5	11,500	27I	626,650	63			39	88,700
34	10	20,800	266	615,150	64	5	10,900	39	88,700
35	8	19,200	256	594,350	65	2	3,600	34	77,800
36	3	8,600	248	575,150	66	6	13,900	32	74,200
37	3	6,800	245	566,550	67	7	14,700	26	60,300
38	2	6,100	242	559,750	68	3	6,500	19	45,600
39	8	19,000	240	553,650	69	2	5,800	16	39,100
40	7	17,700	232	534,650	70	4	9,300	14	33,300
41	8	22,200	225	516,950	71	2	5,800	10	24,000
42	10	22,700	217	494,750	72	I	2,500	8	18,200
43	10	22,000	207	472,050	73	I	2,500	7 6	15,700
44	9	26,550	197	450,050	74	I	3,500		13,200
45	9	20,000	188	423,500	75	I	1,800	5	9,700
46	9	21,800	179	402,600	76	1	2,500	4	7,900
47	7	16,900	170	380,800	77	1	1,800	3	5,400
48	9	19,100	163	363,900	78 -8 3	• • •		2	3,600
49	11	21,200	154	344,800	84	1	1,800	2	3,600
50	6	14,200	143	323,600	85	• • •	- 0	I	1,800
51	14	31,600	137	309,400	86	I	1,800] [1,800
52	9	18,500	123	277,800		••	• • •		•••

TABLE 160-NUMBER AND SALARIES OF ACTIVE MEM-BERS CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Supreme Court, First Department, Retirement Fund

Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	I	\$1,800	294	\$673,550	16	18	\$38,000	147	\$342,100
1	7	14,400	293	671,750	17	8	16,200	129	304,100
2	10	20,200	286	657,350	18	13	32,800	121	287,900
3	5	9,200	276	637,150	19	17	38,300	108	255,100
4	11	22,600	271	627,950	20	12	27,800	91	216,800
5	5	11,100	260	605,350	21	7	16,500	79	189,000
6	4	9,700	255	594,250	22	10	23,800	72	172,500
7	31	78,500	251	584,550	23	5	9,900	62	148,700
8	12	22,300	220	506,050	24	11	23,800	57	138,800
9	11	28,400	208	483,750	25	9	20,500	46	115,000
10	10	20,300	197	455,350	26	3	7,900	37	94,500
11	7	18,200	187	435,050	27	4 6	6,300	34	86,600
12	12	25,100	180	416,850	28		14,400	30	80,300
13	6	15,700	168	391,750	29	. 2	4,800	24	65,900
14 15	10	21,700	162	376,050	30 & over	22	61,100	22	61,100
13	5	12,250	152	354,350	UVEI	ľ			•

TABLE 161—NUMBER AND PENSIONS OF ALL DISABILITY PENSIONERS CLASSIFIED BY AGE

Supreme Court, First Department, Pension Fund

Pension	Number	Age	Pensions	Number	Age
\$75		74	\$2,000	I	50
90	1	79	\$2,000 600	ı	55
75	I	83	2,000	I	59
-		li -	2,150	2	67
\$10,2	0	Total	1,080	1	69

VALUATION BALANCE SHEET

The following valuation balance sheet gives the valuation of the assets as of June 30, 1914, and shows the complete financial condition of the fund

TABLE 162—A VALUATION OF ASSETS AND LIABILITIES OF FUND—VALUED AS

Liabilities	
Item	Present Value of Payments to be Made
Pensions to 9 Pensioners now on the pension roll of the fund as follows: Annual pensions aggregating \$10,230	\$58,720
Total Pensions Entered Upon Pensions to such Employees as will retire from the present active force of	\$58,720
294 employees: Service Pensions Disability Pensions	\$798,885 80,258
Total Pensions not Entered Upon	\$879,143
Grand Total	\$937,863

and liabilities of the Supreme Court, First Department, Retirement Fund, as of that date:

THE SUPREME COURT, FIRST DEPARTMENT, RETIREMENT OF JUNE 30, 1914

Assets	
Item	Present Value of Payments to be Received
Funds in hand	\$5,974 73,176 858,713
Grand Total	\$937,863

Nors—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$36,600.

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death or revocation of pension. This table does not take into account the interest factor as it does not affect the appropriation if the amounts are appropriated as the pensions become payable. It simply shows the actual payments which are represented in the balance sheet by the present value of future pensions to persons now on the roll; that is, present pensioners.

TABLE 163—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Supreme Court, First Department, Retirement Fund

Year After Valuation	*Date	Disability Pensions	Year After Valuation	*Date	Disability Pensions
0	1914	\$0,602	22	1936	\$338
. 1	1915	8,483	23	1937	275
2	1916	7,459	24	1938	231
3	1917	6,539	25	1939	197
4	1918	5,733	26	1940	165
5	1919	5,024	27	1941	135
3 4 5 6 7 8	1920	4,361	28	1942	112
7	1921	3,753	29	1943	93
8	1922	3,250	30	1944	74
	1923	2,838	31	1945	55
10	1924	2,463	32	1946	42
11	1925	2,124	33	1947	35
12	1926	1,830	34	1948	28
13	1927	1,584	35	1949	21
14	1928	1,364	36	1950	14
15	1929	1,171	37	1951	10
16	1930	998	38	1952	7
17	1931	844	39	1953	1 4
18	1932	711	40	1954	l i
19	1933	594	1		1
20	1934	497	-		·
21	1935	413	Total	. 	873,472

Date Year Beginning July 1st.

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Supreme Court, First Department, expressed as a percentage of the employee's salary:

TABLE 164—RATES OF CONTRIBUTION EXPRESSED AS PER-CENTAGES OF SALARIES NECESSARY TO PAY FOR THE VARIOUS PENSION BENEFITS OF THE SUPREME COURT, FIRST DEPARTMENT, RETIREMENT FUND

Age at Entrance	Total	Service Pension (1)	Disability Pension (2)	Age at Entrance	Total	Service Pension (1)	Disability Pension (2)
20	2.61	1.98	.63	31	3.80	3.31	.49
21	2.73	2.08	.65	32	3.91	3.45	.46
22	2.85	2.18	.67	33	4.02	3.60	.42
23	2.96	2.29	.67	34	4.13	3.74	.39
24	3.07	2.40	.67	35	4.23	3.88	.35
25	3.17	2.52	.65	36	4.34	4.02	.32
26	3.27	2.64	.63	37	4.45	4.16	. 29
27	3.37	2.77	.60	38	4.55	4.30	.25
28	3.48	2.90	. 58	39	4.64	4.42	.22
29	3.58	3.03	.55	40	4.73	4.54	. 19
30	3.69	3.17	.52	11 1		·	l

SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND

BENEFITS AND CONTRIBUTIONS AS DEFINED BY LAW AND PRACTICE

The following digest gives (1) a summary of such provisions of the law relating to the Supreme Court, Second Department, Retirement Fund as affect the actuarial valuation of that fund, and (2) a statement of the average pensions which have been allowed in the past experience of the fund under the discretionary powers granted by the law.

Benefits

Upon disability after 25 years' service, a pension of not more than one-half of average of last two years' salary.

Because of a lack of sufficient experience the average allowance used was 50 per cent. of average of last two years' salary.

Contributions

BY EMPLOYEES

No contribution.

By CITY

Indirect contributions:

None provided.

Direct contributions:

Budgetary appropriations to cover maturing pensions.

Rates required to value benefits and contributions

In order to make an actuarial valuation of a fund governed by these laws it was necessary to develop the following rates:

Rate of withdrawal from service due to resignation or dismissal

Rate of death

Rate of retirement

Rate of change of salary

Rate of death among pensioners.

BASIC DATA AND THEIR DEVELOPMENT

In the valuation were included schedules for all employees of the Supreme Court, Second Department, except the judges, who are carried under the valuation of pensions for elected employees and the employees in the Appellate Division, who are paid exclusively by the State. The reason for the exclusion of these employees will be taken up in the discussion of the valuation balance sheet presented later.

The experience used as a basis for the rates has been described on page 279, in connection with the Supreme Court, First Department, Retirement Fund. As the experience of the two funds was combined no summary tables are shown here.

RATES AND COMPARISONS

In the process of development, as has previously been stated, the rates were compared with all available rates which were in any way similar. No detailed comparisons are given in this report but brief comments are made on each rate to indicate its distinctive features and to suggest an explanation therefor.

The active service

The following table shows the rates which were used in constructing the active service table. To visualize the increases and decreases in the rates from age to age and to show their relative importance at various ages, a diagram is given on page 282, showing the rates plotted on cross section paper.

TABLE 165—RATES OF SEPARATION FROM ACTIVE SERVICE
Supreme Court, Second Department, Retirement Fund

Age	Rate of Withdrawal	Rate of Death	Rate of Retirement	Age	Rate of Withdrawal	Rate of Death	Rate of Retirement
	• q _z (a)	• q _z ^(a)	• ₇ q _z (a)	Age	• q _z ^(a)	^d q _z ⁽⁶⁾	•rq (•
20	.0402	.0031		56	.0007	.0122	.0284
21	.0366	.0033		57	.0006	.0127	.0305
22	.0331	.0034		58	.0004	.0133	.0330
23	.0302	.0036		59	.0003	.0139	.0351
24	.0273	.0037		60	.0002	.0146	.0378
25	.0248	. 0039	1	61	1000.	.0153	.0405
26	.0227	.0040]	62	1	.0162	.0435
27	.0207	.0042]	63	1 1	.0171	.0460
28	.0188	. 0044	1	64	1 1	.0181	.0490
29	.0172	. 0045	1	65	l l	.0192	.0517
30	.0157	.0047	1	66		.0205	.0548
31	.0142	.0040	1	67	l i	.0220	.0583
32	.0130	.0050	l l	68	l l	.0230	.0626
33	.0120	.0052	1 1	69	1 1	. 0260	.0672
34	.0100	.0054	l	70	1	.0285	.0720
35	.0100	.0056	1 (71	l l	.0315	.0777
36	1000.	.0058	1	72	l l	.0350	.0835
37	.0083	. 0060	1 1	73		. 0385	.0800
38	.0075	.0062	1 1	74	1 1	.0426	.0067
39	.0068	.0064	1 1	75	1 1	.0473	.1041
40	.0061	. 0067	.0005	76	1 1	.0525	.1125
41	.0054	. 0060	.0018	77	1 1	. 0578	.1215
42	.0048	.0071	.0036	78	1 1	. 0635	.1310
43	.0043	.0074	.0040	79	1 1	. 0606	. 1420
44	.0038	.0077	.0061	80	1 1	.0763	.1543
45	.0034	.0079	.0070	81	1 1	. 0835	. 1675
46	.0030	.0082	.0007	82	1 1	.0015	. 1830
47	.0027	.0085	.0113	83	1 1	. 1000	.2010
48	.0023	.0088	.0120	84	1 1	. 1005	.2225
49	.0021	.0002	.0148	85	1 1	. 1103	. 2400
50	8100.	.0005	.0164	86	1 1	. 1203	. 2850
51	.0016	. 0099	.0184	87	1 1	. 1300	.3375
52	.0014	.0103	.0200	88	1	. 1510	.4250
53	.0012	.0107	.0220	89		. 1623	.5000
54	.0010	.0112	.0230	90	1 1	. 1735	.8265
55	.0000	.0116	.0250				1

RATE OF RESIGNATION AND DISMISSAL

The same rate of withdrawal was used for this department as was employed in the pension fund for the Supreme Court, First Department.

RATE OF DEATH

The rate of death among members of the active service of the Supreme Court, Second Department, Retirement Fund is the same as that used for the Supreme Court, First Department.

RATE OF DISABILITY

3

Since in the Supreme Court, Second Department, no pension is allowable on disability, if the disability occurs within the first twenty-five years of service, the disability rate prepared for use in the valuation of the funds in the Supreme Court, First Department, was not needed here. All retirements after twenty-five years of service were considered as service retirements even though they were occasioned by disability.

RATE OF SERVICE RETIREMENT

The rate of service retirement for the Supreme Court, Second Department, was made by combining into a single rate the rate of disability retirement and the rate of service retirement as used for the Supreme Court, First Department, on the assumption that the same proportion of employees, after they had reached the age of eligibility, would retire in the Supreme Court, Second Department, as in the Supreme Court, First Department. The retirements under the Second Department fund are, of course, technically, disability retirements, as no legal provision is made for service retirement, but since only one type of pension is provided it has been considered for comparative purposes a service pension.

RATE OF SALARY CHANGE

The rate of salary change used for this department is the same as that employed in the valuation of funds, as explained on page 279, for the Supreme Court, First Department, Retirement Fund.

Pensioners

The rate of death adopted was the same as that selected for the Supreme Court, First Department. This rate is shown in the table on page 284.

SERVICE AND MORTALITY TABLES AND SALARY SCALE

The following table is based on the rates discussed above. The mortality table for pensioners is the same as that adopted for the disability pensioners of the Supreme Court, First Department, and is shown on page 287.

TABLE 166—ACTIVE SERVICE TABLE AND SALARY SCALE

Supreme Court, Second Department, Retirement Fund

- F	Living (6)	Withdrawals w	Deaths $d^{(a)}$	Retirements (a)	Total Decrement	Salary Scale 5s	γle	Living f(a)	Withdrawals w (a)	Deaths d ^(a)	Retirements or (a)	Total Decrement	Salary Scale 5s
<u> </u>	1,000,000	40,200	3,100	:	43,300	1,365	56	418,336	202	5,083	11,889	17,269	2,300
_	956,700	35,015	3,100	:	38,124	1,432	57	401,067	229	5,086	12,224	17,539	2,290
22	918,576	30,405	3,123	:	33,528	1,500	88	383,528	191	2,097	12,645	17,903	2,280
23	885,048	26,728	3,160	:	29,888	1,575	59	365,625	011	5,079	12,833	18,022	2,270
_	855,160	23,346	3,173	:	26,510	1,646	8	347,603	63	5,072	13,121	18,256	2,260
	828,641	20,550	3,215	:	23.765	1,710	19	329,347	23	5,039	13,339	18,401	2,255
_	804.876	18,270	3,236	:	21.506	1.780	62	310,046	· :	5,022	13,520	18,542	2,240
_	783,370	16,216	3,282	:	10.408	1.84	ន	202,404	 :	4,986	13,450	18,436	2,235
	763,872	14,384	3,323	:	17.707	1.020	2	273,068	:	4,045	13,416	18,361	2,225
2	746,165	12,797	3,373	:	16,170	1,078	65	255,607	:	4,908	13,207	18,115	2,220
30	729,995	11,424	3,424	:	14,848	2,035	9	237,492	:	4,868	13,015	17,883	2,210
31	715,147	10;177	3,490	:	13,667	2,000	29	219,600	:	4,831	12,797	17,628	2,200
_	701,480	9,133	3,536	:	12,669	2,140	80	186,102	:	4,827	12,636	17,463	2,190
_	688,811	8,238	3,596	:	11,834	2,185	8	184,518	:	4,797	12,396	17,193	2,180
34	676,977	7,393	3,662	:	11,055	2,225	2	167,325	:	4.769	12,047	16,816	2,170
_	665,922	6,633	3,736	:	10,369	2,265	7	150,509	:	4,741	669'11	16,440	2,165
	655,553	996'5	3,802	:	9,768	2,205	7.2	134,069	:	4,692	11,199	15,891	2,160
_	645,785	5,34I	3,875	:	9,216	2,320	73	118,178	:	4.550	10,622	15,172	2,150
	636,569	4,762	3,959	:	8,721	2,340	*	103,006	:	4,388	9,064	14,352	2,140
_	627,848	4,238	4,043	:	8,281	2,350	75	88,654	:	4,189	9,231	13,420	2,130
\$	619,567	3,748	4,139	279	8,166	2,360	92	75,234	:	3,950	8,464	12,414	2,120
	611,401	3,320	4,219	1,113	8,652	2,365	77	62,820	:	3,628	7,633	11,261	2,110
42	602,749	2,917	4,304	2,170	9,391	2,370	78	51,559	:	3,274	6,754	10,028	2,085
43	593,358	2,540	4,415	2,925	9,880	2,375	2	41,531	:	2,888	2,898	8,786	2,070
‡	583.478	2,217	4,481	3,577	10,275	2,375	8	32,745	:	2,497	5,052	7,549	2,060
.	573,203	1,937	4,546	4,528	110,11	2,375	81	25,196	:	2,104	4,220	6,324	2,040
_	562,192	1,674	4,616	5.454	11,744	2,370	82	18,872	:	1,727	3,453	5,180	2,025
+	550,448	1,459	4,684	6,226	12,369	2,365	8	13,692	:	1,369	2,752	4,721	2,010
\$	538,079	1,254	4,7SI	6,941	12,946	2,360	2	1/2/6	:	1,048	2,130	3,178	1,989
\$	525,133	1,098	4,815	7,762	13,675	2,355	82	6,393	:	763	1,592	2,355	1,970
20	SII,458	936	4,859	8,393	14,188	2,350	8	4,038	:	522	1,151	1,673	1,945
21	497,270	962	4,918	9,150	14,864	2,340	84	2,365	:	331	798	1,129	1,920
_	482,406	675	4,964	9,648	15,287	2,335	88	1,236	:	187	525	712	1,895
53	467,119	261	4,998	10,253	15,812	2,330	6	524		8	300	394	1,865
	451,307	465	5,032	10,768	16,265	2,320	8	130		2.	101	Or I	1.840
	435,042	379	5,055	11,272	16,706	2,310	:	9	:	3		2	, -
-		-	-	_	_	?		:	:	:	:	:	:

PRESENT VALUE OF BENEFITS AND CONTRIBUTIONS

The present value of the benefit was developed from the preceding service and mortality table. The following table shows the present value of total salary to be earned during active service on a basis of an assumed salary of \$1,000, and the present value of a pension of final salary in terms of an assumed entrance salary of \$1,000 upon event of the condition upon which pension is payable, as given in the enumeration of benefits and contributions.

TABLE 167—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE RECEIVED BY ENTERING MEMBERS, AND THE PRESENT VALUE OF THE PENSION BENEFIT PAYABLE TO THESE MEMBERS BASED ON AN ENTRANCE SALARY OF \$1000

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Supreme	Court.	Second	Department.	Retirement	Fund
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Age at Entrance	Total Future Salary	Pension to Members Upon Retirement	Age at Entrance	Total Future Salary	Pension to Members Upon Retirement
20	\$21,333	\$397	35	\$15,943	\$501
25	19,567	446	40	14,866	524
30	17,576	477			

The expectation of life and the present value of a pension of one to pensioners is shown on page 288.

ACTIVE SERVICE AND PENSION ROLLS CONSIDERED IN VALUATION

The following tables show the number of employees in active service as of June 30, 1914. No table for pensioners is presented as there is but one pensioner. His pension amounts to \$900 per annum.

TABLE 168—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY AGE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

Supreme Court, Second Department, Retirement Fund

Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Numberat Indicated Age or Above	Total Salaries at Indicated Age or Above
26	I	\$2,750	138	\$322,400	53			43	\$104,400
27	I	1,500	137	319,650	54	5	\$16,400	43	104,400
28			136	318,150	55	2	6,100	38	88,000
29	1 1		136	318,150	56			36	81,900
30	r	1,500	136	318,150	57	2	3,500	36	81,900
31	I	1,800	135	316,650	58	1	3,000	34	78,400
32	4	11,750	134	314,850	59			33	75,400
33	4	7,000	130	303,100	60	I	1,600	33	75,400
34	5	9,500	126	296,100	61	I	3,600	32	73,800
35	5	10,250	121	286,600	62	4	10,800	31	70,200
36	7 6	15,800	116	276,350	63	I	3,600	27	50,400
37		16,000	100	260,550	64	I	2,000	26	55,800
38	6	14,500	103	244,550	65			25	C3.800
39	4	11,100	97	230,050	66	2	3,300	25	\$3,800
40	7	13,300	93	218,950	67	5	8,900	23	50,500
41	5	11,000	86	205,650	68	2	3,500	18	41,600
42	3	5,800	81	194,650	69	2	5,600	16	38,100
43	I	1,800	78	188,850	70	2	4,300	14	32,500
44	4	10,500	77	187,050	71	5	10,800	12	28,200
45	I	1,500	73	176,550	72	ī	3,600	7	17,400
46	9 6	22,600	72	175,050	73	.		6	13,800
47	6	14,050	63	152,450	74	2	5,000	6	13,800
48	3	6,500	57	138,400	75			4	8,800
49	3	9,000	54	131,900	76	2	3,800	4	8,800
50		• • •	51	122,900	77	I	2,000	2	5,000
51	7	16,000	51	122,000	78			1	3,000
52	I	2,500	44	106,900	79	I	3,000	1	3,000

TABLE 169—NUMBER AND SALARIES OF ACTIVE MEMBERS, CLASSIFIED BY LENGTH OF SERVICE, WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE

Supreme	Court.	Second	Department,	Retirement	Fund
Dupicinc	О ш с,		- Cper union c,	Ter en ement	Lunu

Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service Years	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0	7	\$12,000	138	\$322,400	16	3	\$6,500	23	\$60,400
1	و ا	19,400	131	310,400	17	I	1,600	20	53,900
2	24	46,750	122	291,000	18	3	10,600	19	52,300
3	8	16,450	98	244,250	19	4	8,300	16	41,700
4	3	8,600	90	227,800	20	1	3,000	12	33,400
5	7	12,900	87	219,200	21	1	5,000	11	30,400
6	2	5,750	80	206,300	22	1	3,000	10	25,400
7	32	77,5∞	78	200,550	23	4	7,400	9	22,400
8	I	1,800	46	123,050	24			5	15,000
9	4	11,200	45	121,250	25			5	15,000
10	2	4,750	41	110,050	26	1	1,800	5	15,000
11	2	6,000	39	105,300	27			4	13,200
12	I	2,000	37	99,300	28			4	13,200
13	2	4,800	36	97,300	29			4	13,200
14	1	3,000	34	92,500	30 &	ایا	13,200		13,200
_15	10	29,100	33	89,500	over	4	-3,200	4	13,200

VALUATION BALANCE SHEET

The law establishing the pension system of the Supreme Court, Second Department, Retirement Fund provides that the pensions shall be paid from the same source as that from which the salaries were paid during active service. The salaries are paid partly by the state and partly by the city, the total amounts being apportioned between the counties within the jurisdiction covered by the court according to their taxable valuation. The city pays the amounts chargeable against the counties within its limits.

When the schedules for the department were collected it was decided to value the pensions of all persons paid wholly or partly by the city and then to apportion the liability on the same basis on which the salaries are apportioned in order to obtain the total liability for pensions of the city. At the time the census for employees was taken the employees in the Appellate Division of the Supreme Court pension fund omitted to prepare cards on the theory that they received their entire salaries from the state and therefore would not be covered in the investigation of the city. data for these employees could therefore be included, but the cards for the others were used. Of the total amount expended for salaries in the Supreme Court, Second Department, for the year ending December 31, 1914, about 86% were for the divisions intended in the valuation. Of the total salaries paid in that year about 95% were borne by the city and since this apportionment was based on the taxable valuations of the relative counties, it was deemed a proper basis for apportioning the liability. The following balance sheet, therefore, gives the entire liability for pensions as regards the employees considered and the estimated total liability which may be chargeable against the city as of June 30, 1914. The later figure was obtained by the use of the factor $\frac{95}{86}$, which represents the combination of the ratios previously mentioned.

TABLE 170—A VALUATION OF ASSETS AND LIABILITIES OF FUND—VALUED AS

Liabilities					
		VALUE OF TO BE MADE			
I trans	Included in	To All Mem- bers Who Re- ceive Salaries Paid by City			
Pension of \$900 to one Pensioner now on the pension roll of the fund	\$4,357	\$4,357			
Total Pensions Entered Upon	\$4,357	\$4,357			
Pen:ions to such Employees as will retire from the present active force of 138 employees	\$234,712	\$259,275			
Total Pensions not Entered Upon	\$234,712	\$259,275			
Grand Total	\$239,069	\$263,632			

THE SUPREME COURT, SECOND DEPARTMENT, RETIREMENT OF JUNE 30, 1914

Assets					
	PRESENT PAYMENTS TO	VALUE OF BE RECEIVED			
Ітям	Included in	To Ali Mem- bers Who Re- ceiveSalaries Paid by City			
Funds in hand	\$239,069	\$263,632			
Grand Total	\$239,069	\$263,632			

The following table shows the estimated amount of appropriation which will be required to continue the pensions of present pensioners until death. This table is based on the mortality table of pensioners and does not take into account the interest factor, which does not affect the appropriation if the amounts to pay pensions are appropriated as the pensions become payable.

TABLE 171—AGGREGATE AND DETAILED ANNUAL COST OF PENSIONS TO PERSONS ON THE PENSION ROLL

Year After Valuation	*Date	Pensions	Year After Valuation	*Date	Pensions
•	1914	\$843	9	1923	\$183
1	1915	737	10	1924	130
2	1916	645	11	1925	92
3	1017	566	12	1926	65
4	1918	486	13	1927	39
5	1919	407	14	1928	12
ě	1920	342			1
7	1921	342 289	Total		\$5.072

Supreme Court, Second Department, Retirement Fund

PERCENTAGE OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS

The following table shows the cost of pensions under the present pension fund of the Supreme Court, Second Department, Retirement Fund, expressed as a percentage of the employee's salary.

TABLE 172—RATES OF CONTRIBUTION EXPRESSED AS PER-CENTAGES OF SALARIES NECESSARY TO PAY FOR THE PENSION BENEFIT OF THE SUPREME COURT, SECOND DEPARTMENT, RETIREMENT FUND.

Age at Entrance	Total Pension	Age at Entrance	Total Pension	Age at Entrance	Total Pension
20	1.87	27	2.45	34	3.06
21	1.94	28	2.54	35	3.14
22	2.02	29	2.63	36	3.23
23	2.11	30	2.71	37	3.31
24	2.19	31	2.80	38	3-39
25	2.28	32	2.89	39	3.46
26	2.37	33	2.97	40	3 · 53

^{*}Date Year Beginning July 1st.

SECTION III

STATISTICS OF FAMILY HISTORY, WITH AN EXPLANATION
OF THE DEVELOPMENT OF THE MONETARY VALUES
REQUIRED IN ESTIMATING THE COST OF
PENSIONS FOR DEPENDENTS

1

STATISTICS OF FAMILY HISTORY, WITH AN EXPLANATION OF THE DEVELOPMENT OF THE MONETARY VALUES REQUIRED IN ESTIMATING THE COST OF PENSIONS FOR DEPENDENTS

Four pension funds—namely, the Police Pension Fund, the Fire Department Relief Fund, the Health Department Pension Fund and the Department of Street Cleaning Relief and Pension Fund, provide benefits for dependents; that is, for widows, children under eighteen, and dependent parents. The value of these benefits to dependents has, of course, been stated in the special sections of this report that deal with these four funds, and has been considered in determining their condition; but in the discussion of the separate funds no description has been given of the methods employed in making the valuation of benefits to dependents. For two reasons it seemed best to reserve this subject for consideration in a distinct section.

For each of the four funds the data were originally developed separately, but on comparison all were found to be essentially alike. All the data were therefore combined and used as the basis for a single set of primary tables which were considered applicable to each of the four funds. A single description, therefore, suffices for all.

Such an arrangement, moreover, will probably serve to make the report more convenient. Persons who are interested simply in the condition of the specific funds and do not care to go into the subject of the methods of valuing benefits to dependents need not be concerned at all with the present sections, since the results have been given in the sections devoted to the separate funds; but persons interested in the valuation of funds with such benefits will doubtless prefer to have the whole subject treated in one place, as the results have a value beyond their immediate use in this report. Data which can be used as a basis for valuing benefits of this character have been very limited. In fact the Commission, in its study of municipal and industrial pension funds in this country, was unable to locate a single source from which such data could be obtained in a form suitable for use in a valuation. Actuaries in this country have used data compiled abroad. Tables based on the population of New Zealand and others prepared by the Actuarial Committee which devised the proposed superannuation scheme for the Municipal and Shire Services of New South Wales are among the principal ones available. The present report makes available some American data and consequently it has seemed advisable to treat the subject somewhat broadly, so that those who may have occasion to use the figures may know precisely how they have been derived.

In the following discussion the data used as a basis in determining the ages and probable number of dependents left by an employee are taken up first; then the basis for determining the mortality experienced by such dependents is given, and finally a description of the formulæ or general methods employed in using the tables in the valuation of the pension benefits.

DESCRIPTION OF DATA—IN GENERAL

Although the facts regarding the family history of the employees were collected in each branch of the city government, they were only tabulated for those departments where pensions were allowed to dependents, as the Commission did not feel justified, at the time, in tabulating data which were not essential to its work. Moreover, if tables had been based on all the data collected and had varied materially from those based on the data for the four funds, they could not have been employed for the valuations required. As the family history data tabulated showed little correlation with the occupations of the employee, it seemed improbable that the development of the other data would have furnished any important additional evidence to guide the Commission in deciding whether to combine the data for the four departments in making the required valuations.

The number of persons considered in deriving the tables for this section of the report is given in the following summary statement:

TABLE 173—NUMBER OF PERSONS, EMPLOYEES AND MEMBERS OF THEIR FAMILIES, INCLUDED IN THE TABULATIONS OF FAMILY DATA

Class	Number
Employees:	
Single Men	4,808
Husbands, With Children	13,136
Without Children	2,016
Not Reporting	324
Total	16,376
Widowers or Divorcees, With Children	737
Without Children	172
Not Reporting	59
Total	968
Total	22,152
Dependents:	,-3-
Adults:	
Wives, Reporting Age	16,081
Not Reporting Age	295
Total	16,376
Widows, Pensions in Force	2,113
Pensions Terminated	405
Total	2,518
Parents	20
Children:	-9
Not Pensioned	42,413
Now on Pension	183
Pensions Terminated.	236
Total	42,832
IVIG1	42,032
Total	83,907

MARITAL CONDITION OF EMPLOYEES

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The following tabulation shows all the employees considered, classified by marital condition. Attention is called to the fact that no distinction was made between the first and subsequent marriages. Such refinements are not required for valuations under the present laws and the returns on the schedules do not afford the proper basis for such tables.

TABLE 174—TABULATION OF MARITAL CONDITION OF EMPLOYEES

Police, Fire, Health and Street Cleaning Department Funds Combined

	Total	Single	Mari	RIED MEN		Total	Single	MARI	RIED MEN
AGE	Number M	Men	Hus- bands	Widowed or Divorced	AGE	Number	Men	Hus- bands	Widowed o Divorced
15	I	1			53	319	20	265	34
16	9	9			54	371	28	301	42
17	10	10			55	303	20	247	36
18	5	5			56	219	6	193	20
19	13	13	• • •		57	175	4	144	27
20	18	18			58	144	8	113	23
21	21	21			59	124	4	92	28
22	70	61	9		60	117	4	97	16
23	284	216	68		61	88	3	64	21
24	468	333	131	4	62	68	3	58	7
25	554	324	225	5	63	55	2	44	9
26	540	289	248	5 3	64	56	2	44	10
27	626	310	313	3	65	36		25	11
28	713	296	413	4	66	38		30	8
29	899	326	565	8	67	22		15	7
30	1,013	309	687	17	68	16		12	4
31	929	265	651	13	69	14	I	8	
32	950	241	688	21	70	10		8	5 2 3 8
33	870	213	637	20	71	8		5	3
34	903	187	689	27	72	9		I	8
3 5	917	171	724	22	73	4		3	1
36	907	148	734	25	74	5		4	1
37	846	118	711	17	75	1		I	·
38	876	133	713	30	76	1			1
39	766	97	640	29	77	1			1
40	721	91	596	34	78				.
41	636	56	547	33	79	I		r	
42	678	81	568	29	80	1			r
43	525	41	455	29	81	1			1
44	623	68	533	22	82	1		1	1
45	590	51	506	33	83				
46	530	42	456	32	84				
47	499	45	419	35	85				
48	403	29	343	31	86	• • •			1
49	355	28	298	29	87				1
50	407	22	360	25	88				1
51	397	23	347	27					
52	372	12	326	34	Totals	22,152	4,808	16,376	g68

To value pensions to widows and children by the methods used in this report it is necessary to know the probable number of employees who will die as husbands and the probable number who will die as widowers or divorcees. If it be assumed that the distribution according to marital condition is the same for persons dying as for the living at corresponding ages, a conservative assumption which is customary in valuations of this kind because of the paucity of data regarding deaths, then the required probability may be obtained from the combination of the probability of death and the probable marital condition of the employee at the time of death. To secure these data in a form suitable for use it is necessary to graduate the proportions in each marital status at each age.

The assumption that these proportions could be considered the same in each of the four departments was not made at the outset, but the proportions for each fund were developed separately as the tabulations were completed. After that work was finished the results were compared, and the conclusion reached that it was unnecessary at this time to use separate ratios for each department in the valuations; consequently they were combined. The comparisons made between the figures for each of the four departments separately and those for the four combined are presented in two diagrams; the first of which shows the graduated proportion reported as husbands, and the second the graduated proportion reported as widowers or divorcees. A third diagram is presented showing on one sheet the two final curves derived from the combined data, together with what might be called the complementary curve showing the graduated proportion reported as single men.

When the proportions obtained from the four departments are compared with similar proportions from other funds for which figures are available, the proportion married in these New York services is found to be reasonably high, although it can hardly be said to be higher than was to have been expected from the figures from the other funds. The table on page 314 shows the comparison.

Attention should be called to the fact that the ratios for the various funds are not absolutely comparable, for the methods used in deriving them varied somewhat and in some instances the figures available were not in the form of proportions, or were unadjusted, or were given only for certain ages and therefore had to be worked over into comparable form by the Commission. These differences are not of such importance to warrant a detailed discussion, and it can be said that the bases are sufficiently alike to justify general comparisons for practical purposes.

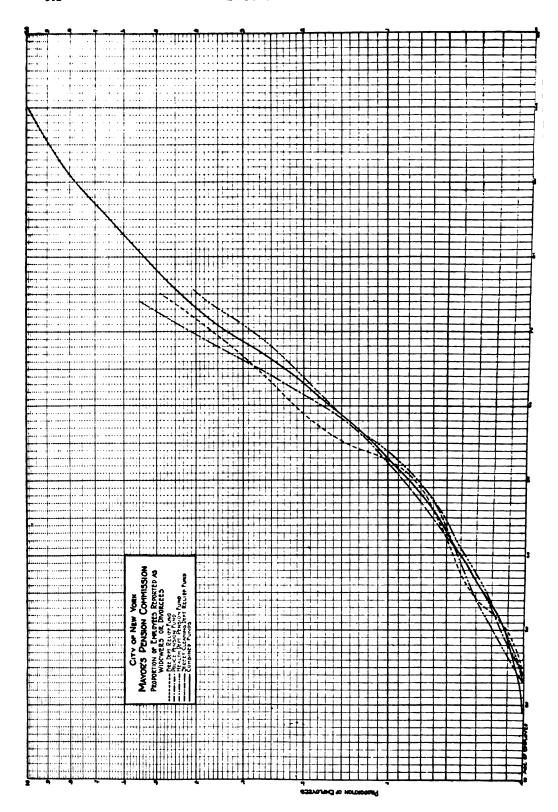


TABLE 175—COMPARISON OF PROPORTION MARRIED AMONG EMPLOYEES, IN NEW YORK CITY POLICE, FIRE, HEALTH AND STREET CLEANING DEPARTMENT FUNDS COMBINED, WITH SIMILAR RATIOS USED IN THE VALUATION OF OTHER FUNDS

	PROPORTION MARRIED								
AGE	N. Y. C. Employees in Four Departments	Norwegian Railway Employees and Population (Schjoll)	German Railway Employees (Behm)	New South Wales Public Service Employees (Trivett)	Employees in Scottish Banks (Hewat)	Employe in Canadia Banks (King)			
17		.005		·		1			
18	.0050	.015	• • •			1			
19	.0210	.030		.005					
20	.0480	.055	.0041	.010	.002				
21	.0900	.090	.0213	.025	- 006				
22	.1450	. 135	.0550	.050	-017				
23	.2300	. 195	. 1065	.110	.036				
24	.3060	. 270	.1866	. 185	.058	1			
25 26	.3840	.360	. 2896	. 265	880.	1 :::			
27	.4550	-445	.4002	.340	.119	.010			
28	.5150	. 525 . 600	.5101 .6168	.420	- T 5 I	.070			
29	. 5790 . 6380	.665	.7065	·495 ·570	- 188	.165			
30	.6840	.720	.8172	.640	-250	.262			
31	.7160	.765	.8382	.690	-300	.330			
32	.7440	.800	.8707	.725	351	.385			
33	.7690	.830	.8943	.750	400	.445			
34	.7900	.855	.0111	773	-446	-480			
35	.8115	.877	.9225	795	·495	.515			
36	.8290	.896	.9318	.815	· 542 · 581	-545			
37	.8450	.912	.9401	.830	.613	-575			
38	.8588	.924	.9471	.846	.641	.600			
39	.8702	.932	.9506	.856	.657	.625			
40	.8805	.936	.9508	.865	.671	.655			
41	.8898	-935	.9481	.870	.680	.685			
12	.8975	-934	.9462	.875	.601	-715			
43	.9047	·933	.9424	.880	.700	-745			
4	.9110	.931	.9392	.885	-711	-774			
45 46	.9167	.929	.9391	.890	-718	. 797			
47	.9220	.927	.9367	.893	-724	.820			
48	1 1	.924	.9399	.895	.728	.8 ₃ 8 .8 ₅₅			
1 9	.9311	.921 .917	.9302 .9248	.897	-730	.870			
50	.9390	.917	.9143	.896	-734	.882			
51	.9425	.909	.9044	.806	-739	.800			
52	.9457	.004	.8880	.806	-744	.000			
53	.9485	.800	.8722	.893	-749	.900			
54	.9515	.894	.8542	.888	.754	.927			
55	.9543	.888	.8391	.883	·756	-929			
56	.9572	.882	.8280	.878	.761	. 942			
57	.9600	.876	.8233	.872	.764	-954			
58	.9627	.869	.8203	.806	.768	.965			
59	.9651	.862	.8223	.860	-774	-973			
60	.9675	.854	.8188	.853	· 778 · 786	. 983			
61	.9695	.846	.8017	.846	-793	.991			
62	.9719	.837	.7695	.839	.803	I.000			
63 64	.9742	.827	.7304	• • •	807	I .000			
65	.9761	.816	.6767	• • • • • • • • • • • • • • • • • • • •	.813	I.000			
66	.9782	.804	.6675 .6621		.826	I.000			
67	.9801 .9821	.790 .774	.6568		1 .820				
68	.9839	.756	.6511	1	.822	• • •			
69	.9858	.736	.6453	1 :::	.822	• • •			
70	.9872	.714	.6407	I	1 .822	• • •			
	1 - 3-1-	· / - 		1	.822	• • •			

The foregoing table does not include the ratios for the higher ages because comparative figures are not generally available for ages above these shown. The following table gives for every age the ratio used by the Pension Commission. The rate has been divided in the table so that the proportion found as husbands is shown separately from the proportion found as widowers or divorcees.

TABLE 176—PROPORTION OF ALL EMPLOYEES WHO ARE HUSBANDS, OR WIDOWERS OR DIVORCEES

Police, Fire, Health and Street Cleaning Department Funds Combined

Age x	Proportion Husbands pm ^h	Proportion Widowers or Divorcees pm ^w _z	Age #	Proportion Husbands pm ^h _x	Proportion Widowers or Divorcees pm 20
	·		II		l
18	.0046	.0004	60	.8030	. 1645
19	.0200	.0010	61	. 7930	.1765
20	.0462	.0018	62	. 7839	.1880
21	.0878	.0022	63	.7741	. 2001
22	.1420	.0030	64	.7611	.2150
23	.2261	.0039	65	.7482	.2300
24	.3011	.0049	66	.7341	. 2460
25	.3782	.0058	67	.7171	. 2650
26	.4482	.0068	68	.6959	. 2880
27	.5072	.0078	69	.6758	.3100
28	.5700	.0090	70	.6562	.3310
29	.6275	.0105	71	.6364	-3525
30	.6715	.0125	72	.6171	.3730
31	.7011	.0149	73	-5979	.3940
32	.7262	.0178	74	.5785	.4145
33	.7482	.0208	75	.5591	.4350
34	.7667	.0233	76	.5392	.4560
35	. 7855	.0260	77	.5212	.4750
36	.8004	.0286	78	.5009	.4960
37	.8137	.0313	79	.4818	.5160
38	.8243	.0345	80	.4605	⋅5375
39	.8330	.0372	81	.4398	. 5590
40	.8404	.0401	82	.4170	. 5820
41	.8465	.0433	83	3950	.6040
42	.8507	.0468	84	.3718	.6275
43	.8547	.0500	85	-3494	.6500
44	.8573	.0537	86	·3235	.6760
45	.8594	.0573	87	. 2976	.7020
46	.8605	.0615	88	.2722	.7275
47	.8613	.0655	89	.2458	.7540
48	.8611	.0700	90	.2189	.7810
49	.8603	.0748	91	.1959	.8040
50	.8588	.0802	92	.1729	.8270
51	.8565	.0860	93	.1529	.8470
52	.8539	.0918	94	.1319	.8680
53	.8497	.0988	95	.1110 -	.8890
54	.8452	. 1063	96	.0870	.9130
55	.8398	.1145	97	.0670	.9330
56	.8342	.1230	98	.0460	.9540
57	.8275	. 1325	99	.0250	.9750
58	.8204	.1423	100	.0020	.9980
59	.8110	.1532	II	1	l

RELATIVE AGES OF HUSBANDS AND WIVES

The probable age of the widow left by an employee dying must be used in determining the value of the annuity which becomes payable to her on the death of her husband. The following table shows the data for the four departments combined which were used as a basis for the development of the probable ages employed.

TABLE 177-TOTAL NUMBER OF MEMBERS' WIVES CLASSIFIED BY AGE AND BY AGE OF HUSBAND

Police, Fire, Health and Street Cleaning Department Funds Combined

	+ 81 + 2	
	£1+x	: : : : : : : : : : : : : : : : : : :
	21+2	
	11+x	
	01+x	. : н : : : и и : и : и и и и и и и и и и и и и и и и и и и и
	0+*	
	8+ x	ты ны юны нь тр. 4 ты юны и т.
₩	L+ x	н а : шишили анн : а : пна : 4 : - ан
s AG	y+ *	ин неприноверенове
AND'	S+- x	
HUSBAND'S AGE	+1 ×	H 4 H 4 4 8 H 8 0 W 0 N W 0 L N N L N 0 0 4 4 N W 4 4 N 0 0 H
OF !	++*	· HO 20 40 74 20 20 20 20 20 20 20 20 20 20 20 20 20
Terms	£+x	
	z+x	4 WHO O WHE WOO WOWD WAS TEATHER HOLD 400 0 7
KD IN	1+x	· 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
EXPRESSED		1 - 5 - 4 + 8 - 5 × 5 × 5 × 5 × 5 × 5 × 5 × 5 × 5 × 5
	x	1 7 4 4 4 8 6 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
WIFE		\$\infty\$ 17 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
OP \	1-x	
AGE	z-x	: 0 11 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
VARIOU'S AGES-AGE		. ws 8 6 6 4 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6
s AG		2 12 22 22 22 22 22 22 22 22 22 22 22 22
RIOU	tx	. 4 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
۷۸		. 60 0 0 4 4 4 6 0 0 0 0 0 0 0 0 0 0 0 0
ES AT	S x	
WIVES	9—x	. : 22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
OF	L-x	
NUMBER	8—x	
5 N	6—x	
	01-x	
	z1x	
	£1-x	
	t1-x	
	S1-x	
	+51-2	
<u> </u>		1 1 2 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Number	of Husbands at Age	677 125 219 2219 2219 2219 2244 2334 2345 2345 245 245 245 245 245 255 255 255 255 2
	Hu	
	HUSBAND'S AGE *	22 23 23 23 23 23 25 25 25 25 25 25 25 25 25 25 25 25 25

TABLE 177—TOTAL NUMBER OF MEMBERS' WIVES CLASSIFIED BY AGE AND BY AGE OF HUSBAND—Continued

Police, Fire, Health and Street Cleaning Department Funds Combined

	+ 21+ *	:::: ::::::::::
	£1+x	::::::::::::::::::::::::::::::::::::::
AGE OF WIFE EXPRESSED IN TERMS OF HUSBAND'S AGE	z1+x	· · · · · · · · · · · · · · · · · · ·
	11+2	· · · · · · · · · · · · · · · · · · ·
	01+*	· · · · · · · · · · · · · · · · · · ·
	6+*	H
	8+x	: H : H : : : : H : : : : : : : : : : :
æ5.	L+x	ман : н н : : : н : н : н : . : : : : : :
s's A	9+*	aa : : : : : : : : : : : : : : : : : :
BANI	s+*	МННЯН : 100 Н
Hus	* +*	на : а н ю : н : а :
(S OF	£+x	оо минин м : : : : : : : : : : : : : : : : : :
Tern	z+x	а р м м м и и и и и и и и и и и и и и и и
Ω.	1+*	24 0 0 0 4 4 4 1 1 2 4 2 1 1 1 1 1 1 1 1 1 1 1 1
EXPRESSED IN		
Exp	x	20 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
WIFE	1-2	240 700 E4H 744H H : 4 : 4H : : : : : : : : : : : : :
-AG	z-x	11,7
AGES-	£-x	21 H H H H H H H H H H H H H H H H H H H
, suc	* — x	21 H W H H W C H C H C H C H C H C H C H C
VARI		4-N544N004u W44WW
AT.	\$\$	2
VIVES	9—x	н и н н н г г г г г г г г г г г г г г г
Λ do	L-x	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
BER	8—x	20 80 72 00 00 00 00 00 00 00 00 00 00 00 00 00
NON	6*	0 24 0 24 1 24 2 34 2 1 2 3 2 1 3 3 2 2 3 3 2 3 3 3 2 3 4 3 3 2 3 4 3 3 3 4 4 3 3 3 3 3 4 4 3 3 3 3 4 5 4 3 3 3 4 5 5 3 3 5 6 7 3 6 7 3 3 3 7 8 4 1 3 3 3 8 4 1 3 3 3 8 4 1 3 3 3 8 4 1 3 3 3 1 4 4 3 3 3 1 5 4 3 3 1 5 5 3 3 1 6 4 3 3 1 6 4 3 3 1 7 5 3 3 1 7 5 3 3 1 8 4 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3 1 8 3 3 3
	01-2	м н н н н н н н н н н н н н н н н н н н
NUMBER OF WIVES AT VARIOUS AGES-AGE OF	11-x	
	z1-x	200 агашина : : : : : : : : : : : : : : : : : : :
	£1—x	р 400 4 400 : а на а а на : : : : : : : : : : : : :
	* 1x	иниондиминин : н : : : : : : : : : : : : : : :
	\$1—x	о м м н н м 4 а н м н : : а : : : : : : : : : : : : : : : :
	+21-x	Дан и и и и и и и и и и и и и и и и и и и
Number		2022 2021 2021 2021 2021 2022 2022 2022
	HUSBAND'S AGE *	SS 555 577 588 589 597 597 597 597 597 597 597 597 597 59

In preparing the relative age table, the average age of the wives of husbands of specified ages were first computed, separately for each department; the data were arranged according to the husbands' ages in five year age groups and the average age of the wives in each group was computed as of the central age of the husband. The results for the four departments were so nearly alike that the data were all combined before developing the final table. In preparing the final table the data were grouped similarly but average ages were not used. Instead the number of wives at each age was multiplied by the corresponding annuity value of a widow at that age and then the average annuity value, instead of the average age, was computed and graduated for each age of the husband. It was then possible to go to the annuity table and obtain from it the age which corresponded to the annuity and was the one best suited for the purposes of the valuation. This procedure made allowance for the mortality factor though the results differed very little from what might have been obtained directly from a graduation of the average ages. The following chart shows the unadjusted relative age of wife to that of husband in the various departments, together with the final adjusted relative ages obtained from all the data in the manner just described.

The table on page 320 shows the relative ages used compared with similar ages taken from reports on other funds. Attention is called to the fact that in cases where the age of wife in the comparative rate was shown as corresponding to that of husband at age x instead of at age $x + \frac{1}{2}$, no adjustments have been made, since such differences do not materially affect the comparisons.

TABLE 178—RELATIVE AGE OF WIFE TO THAT OF HUSBAND, POLICE, FIRE, HEALTH AND STREET CLEANING DEPARTMENT FUNDS COMBINED, AND SIMILAR COMPARATIVE AGES USED IN THE VALUATION OF OTHER FUNDS

			Age of Wife (y)		
١	New York City Employees in	Norwegian Rail- way Employees	German Rail- way Employees	Employees in Scottish Banks	Employees in Canadian Bank
۱ ا	Four Departments	and Population (Schjoll)	(Behm)	(Hewat)	(King)
	19.95	21			
	20.30	22	•:		
	20.67	22	28	22.0	
	21.05	23	24	22.4	
۱	21.45 21.95	24 24	23 24	23.2	
.	22.45	25	24	23.6	
1	22.98	26	25	24.0	:::::
	23.40	27	26	24.8	25.0
	23.90	27	26	25.6	25.5
	24.45	28	27	26.4	26.5
	25.20 26.06	29	28 28	27.2 28.0	27.0
	28.90	29 30	20	28.7	28.0 28.5
	31.10	31	30	29.4	20.5
	32.60	32	31	30.1	30.0
	33.75	33	32	30.8	30.5
	34.83	34	32	31.5	31.5
	35 · 45	35	33	32.I	32.0
	35.95	36	34	32.7	33.0
	36.50 37.25	37 3 8	35 36	33.3	34.0
	37.25	39	37	33·9 34·5	34.5
	38.70	40	38	35.2	35·5 36.5
	39.50	41	39	35.9	37.5
	40.35	42	40	36.6	38.5
	41.20	42	4I	37.3	39.5
	41.93	43	42	38.0	40.5
	42.85 43.65	44	43	38.8 39.6	41.5
	43.03	45 45	44 44	40.4	42.5
	45.25	46	45	41.2	43·5 44·5
í	46.03	47	46	42.0	45.5
í	46.80	48	47	42.9	46.5
ĺ	47.60	49	48	43.8	47.5
	48.40	50	49	44.7	48.5
	49.25 50.20	50 51	50 50	45.6 46.5	49.5
	51.00	52	51	47.4	50.5
,	51.85	53	52	48.3	52.5
í	52.65	54	53	49.2	53.5
	53 - 45	55	53	50.1	54.5
į	54 - 49	56	54	51.0	55.5
í	55.20 56.10	56	55 56	51.9 52.8	56.5
	57.05	57 58	57	53.7	57.5
	57.85	59	57	54.6	58.5 59.5
í	58.80	66	58	55.5	39.3
í	59.70	61	59	56.5	1
ĺ	60.60	61	60	57.5	
į	61.45	62	60	58.5	
į	62.40	63	61 62	59.5	
í	63.37 64.30	64 64	62	60.5	
	65.25	65	63	62.5	
í	66.25	66	64	63.5	1
'	67.25	67	64	64.5	1
í	68.28	67	64	65.5	1

TABLE 178—RELATIVE AGE OF WIFE TO THAT OF HUSBAND, POLICE, FIRE, HEALTH AND STREET CLEANING DE-PARTMENT FUNDS COMBINED, AND SIMILAR COMPARATIVE AGES USED IN THE VALUATION OF OTHER FUNDS—Continued

1:

			AGE OF WIFE (y)		
AGE OF Hus- band	New York City Employees in Four Departments	Norwegian Rail- way Employees and Population	German Rail- way Employees	Employees in Scottish Banks	Employees in Canadian Banks
x+3/2	Pour Departments	(Schioll)	(Behm)	(Hewat)	(King)
763/2	69.35	68	65	66.5	
773/	70.45	69	65	67.5	
78 ½	71.45	69	66	68.5	
79 <i>½</i>	72.70	70	66	69.5	
80⅓	73.48	71	67	70.5	
81 1/2	75.00	72	67	71.5	
821/2	76.20	73	67	72.5	
83 1/2	77.40	73		73.5	
84 1/2	78.70	74		74.5	
85 ¾	79.95	74		75.5	1
861/2	81.00	75	••	76.5	
87 1/2	82.05	76		77.5	
88 <u>¼</u>	83.00	76	••	78.5	
891/2	83.60	77	••	79.5	
901/2	84.20	78		80.5	
911/2	84.75	••	••	81.5	• • • • •
921/2	85.45	••		82.5	
931/2	86.00	••	••	83.5	
94 1/2	86.65	••		84.5	
951/2	87.45	••		85.5	
961/2	88.10	••	••	86.5	
971/2	88.75	• •	••	87.5	
981/2	89.35	• •			
99 1/2	89.95	••			

DATA REGARDING EMPLOYEES' CHILDREN

Definite figures on the probable number of employees or pensioners who would die leaving children with a mother living, on the probable number leaving children without a mother living, and on the probable ages of such children at the time, were required for the valuation of pensions allowable under the four funds considered. The laws did not necessitate the valuation of a separate annuity to each child in a family as they provided for the payment of an annuity to the family as a unit and this annuity ordinarily was not decreased before its termination on the event of the youngest child reaching the age of eighteen. The Commission therefore made, for the purpose of this work, tabulations in which only the youngest child in each family was considered, in order to obtain the ages of such children as a basis for determining the value of the annuity. Tables showing the total number of children, classified by age and by the age of the father have, however, been prepared and are here presented because of their value as a basis for valuing annuities, which may possibly be provided in the future, directly dependent on the number of children and because of their general statistical value in showing the number of possible dependents to be provided for in a family. The first three of the following tables are based on the children in the family and the second three on the youngest child in the family.

TABLE 179—TOTAL NUMBER OF HUSBANDS, WIDOWERS AND THE NUMBER AND AGES

Police, Fire, Health, and Street

							Polic	e, Pur	e, He	alth,	and.	Stree
AGE	Total Num-	Number Without	Number With Children	Total Number	Nu	(BER AN	D AGES	ог Сні	LDREN-	-Last	BIRTHI)AT
	ber	Children	Chugren	of Children	0	1	2	3	4	5	6	7
22	7	4	3	4	1	2	• • • •	1	• • • •			
23 24	64	39	25	31	13	9	5	3	I	٠.		
25	127 226	54 90	73 136	105 199	44	21	18	12 21	_ 5		4	- 1
26	247	97	150	244	54 67	53 43	44 51	33	14 14		<u> </u>	B .
27	307	109	198	336	68	63	69	45	33		5 12	
28	406	120	286	486	93	93	64	68	40	ه اد	8 3	_
29 30	563	141	422	757	121	119	112	97	8	3 8	2 50	6 43
31	695 656	191 146	504 510	939 1,040	129 123	124 133	124 123	121	10	1 7	4 8:	
32	704	162	542	1,165	126	120	135	105		- 1	-1	1 1
33	655	148	507	1,128	110		114	115				
34	692	137	555	1,346	95	122	146	123				1
35 36	736	148	588	1,527	121	121	136	131	_ ~	35 13	· · · ·	
37	742 717	120 137	622 580	1,550 1,615	111 94	104	116	121	-,			
38	721	132	589	1,773	105	95 100	105	12	. 1 -	24 13		
39	654	112	542	1,647	87		84	10		15 12		
40	610	95	515	1,638	68	75	79	10	6	01 8	3 129	
41 42	570	77	493	1,668	56	69	73	8.	4		2 104	
43	579 468	70 78	509 390	1,699 1,358	44 35	75 38	62 37	6 6	7		32 102	
44	543	79	464	1,703	41	40	58		2		66	, ,
45	528	55 68	473	1,716	36	Ġι	39	6	0		65 95 70 65	
46	477	68	400	1,476	27	_	35	3			47 60	
47 48	442 361	65 48	377 313	1,401	20 13	21 15	29 17	3		27	50 49	57
49	323	44	279	1,115	7	16	11	3		٠,	28 37	39
50	375	49	326	1,296	10	19	16	20			34 40 18 35	
51	361	27	334	1,389	4	10	10	T.	7	- 1	18 35 22 38	37 40
52 53	351	28	323 266	1,234	7 6	10	8 8	T.		-1	23 25	31
54	299 333	33 31	302	1,090	6		6		2	IO	9 15	25
55	279	31	248	1,074	3	4	5	à	3	16	14 22 8 13	31
56	212	20	192	817	5	4	3	9	<u>></u>	7	6 15	17
57 5 8	165	13 16	152	619 4 85	I	I	5 6	Č		3	5 4	6
59	131	18	115 98	420	3 1	1	1	3		3	4 4	9
60	111	10	101	394	l				1	3	3 1	
61	82	9	73	274			• • • •		f	1	1 3	2
62 63	64	4 6	60 48	266 185	• • • •	1	I	5	i	2	2 4	3
64	54 53		40 50	202			2 I	• • • •		-1	i]
65	35	3 6	20	112						·/ ··	1	• • • •
66	35 18	7	28	· 100						·/ ··	4	• • •
67			15	44	• • •	• • • •	• • • •		• • •	1 ::	71	
68 69	15 12	3	12 12	43	• • • •	• • • •	• • • •	• • • •	٠	1] :::	
70	10		9	49 33			:::		٠			1
71	8		8	30					• • •	1 3	4 ···	• • • •
72	8	1	7	24	• • •		• • • •			• • •		•••
73 74	4	I 2	I	6	• • •	•••	• • •	• • • •				
75	4	2	4 I	13 6	• • •		• · · ·	• • • •	• • • •	• • •		
76	ī		ī	3	• • • •					• • • •	• • • • •	•••
77	1	• • • •	ı	2						: : :	• • •	•••
78 70	• • • •	• • • •	••••	• • • •	•••	• • •	• • • •			- : : :1		:::
79 80	I	• • • •	1	4 6	• • • •	• • • •	• • • •	• • • • •]	1	
81	اا									• • • • [
82	1		I	3]	::1	•••	•••
Total	16,961	3,088										
Total	10,901	3,000	13,873	42,413	1,955	2,022	2,008	Z, I 20	2,130 2	170 2	,164 2,	080

N. B.—Tabulations Include Adopted Children

AND DIVORCEES MAKING A FAMILY HISTORY REPORT OF ALL THEIR CHILDREN

Cleaning Department Funds Combined

Number and Ages of Children—Last Birthday													
8	9	10	11	12	13	14	15	16	17	18	19	20	21 +
							• • • •	• • • •	• • •	• • •	• • • •		
	:::										:::		:
	1		• • • •				• • • •	• • • •	• • • • •	• • • •		• • • •	
3		• • •			:::	• • •	:::	:::	:::	• • •	:::	• • •	•
3	7	3	ī	2	1		I	1					:
22	12	_5	2	2		I		• • •			• • • •	• • • •	•
43 57	28	14 21	4 17	4 8	2							1	:
74	51	34	35	12	6	2	1	1	• • • •	• • • •		• • • •	
59 100	70 77	44 68	35 46	21 31	3 22	5 13	4 6					1	•
118	99	70	71	45	29	24	17	8	2				:
116	103	89	84	64	49	31	28	16	12	4	2	• • • •	•
111	117	95 103	91 109	70 85	60 81	44 64	34 49	21 39	14 24	3 10	3	3	
120	106	83	108	90	82	79	50	43	39	16	11	3	
113	112	100	103 84	88 103	89 90	80 86	58 76	66 6 9	35 49	33 40	18 21	10 17	
119	120	106	94	108	90	100	72	74	72	53	43	35	
69	Šī.	58	90	75	98	84	76	70	72	46	35	26	
94 73	93 91	98 72	109 94	101	105	96 88	74 84	75 94	89 92	75 78	37 65	54 53	I
73	65	74	77	80	83	87	91	77	78	71	67	65	1
73	49	73	74	77	62	83	73 68	76 68	91 65	71	62 62	56	I
53 36	42 41	55 47	52 51	56 62	57 44	72 70	61	62	65	63 60	52	56 49	2
39	48	51	58	53	64	58	69	67	65 78	70	59	54	3
39	50	46	52 48	58 58	61 47	79 68	70 47	74 63	67 73	62 52	82 72	80 63	4
42 17	39 32	35 40	41	44	48	45	47	51	64	61	62	62	3 3
24	41	30	52	48	57	64	67	56	67	61	66	60	5
18 14	26 20	28 20	31 23	27 31	45 24	45 32	37 35	45 31	60 37	52 42	58 33	59 31	4
9	7	16	16	13	18	25	25	18	36	29	33	31	3
5	3	9	12	16 12	1 I 10	15 16	14 17	18 12	15 22	23 16	24 22	20 18	2
4	10 5	9 6	15 4	10	11	15	*8	17	12	15	24	17	2
11	1		2	3	2	5	7 6	8	12	9	8	11	2
6	6 3	3	7 2	2 2	5 3	4 6	4	9 6	13 7	5 7	9 6	13	I
		1	1	1	1	3	I	9	4	8	7	9	1
• • • •	1		• • • •	I	• • •	1	5	1	3	4	7	3	
				:::		1	• • •			1	4	7	
]	1				• • • •		1		• • • •	• • • •	1	1	
• • •	• • • •	I	· · · ·	1	2	• • • •	• • • •	I	•••	1	I		
1			.	1		:::			1			1	
• • • •		• • • •	• • • •	• • • •	• • •	• • • •	• • •	• • • •	• • •	• • •	• • • •	• • • • •	•
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TABLE 180-NUMBER OF HUSBANDS MAKING A FAMILY THEIR

Police, Fire, Health and Street Cleaning

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30	678	183	495	927	129	124	I	24			80	92	80	64
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HISTORY REPORT AND THE NUMBER AND AGES OF ALL OF CHILDREN

Department Funds Combined

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TABLE 181-NUMBER OF WIDOWERS AND DIVORCEES MAKING A FAMILY HISTORY REPORT AND THE

NUMBER AND AGES OF ALL OF THEIR CHILDREN

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TABLE 181-NUMBER OF WIDOWERS AND DIVORCEES MAKING A FAMILY HISTORY REPORT AND THE NUMBER AND AGES OF ALL OF THEIR CHILDREN—Continued.

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AND A CLASSIFICATION OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY TABLE 182—TOTAL NUMBER OF HUSBANDS, WIDOWERS AND DIVORCEES COMBINED, REPORTING CHILDREN, ONLY

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N. B .- Index figure indicates the number of pairs of twins included in total number to which it is affixed.

TABLE 182—TOTAL NUMBER OF HUSBANDS, WIDOWERS AND DIVORCEES COMBINED REPORTING CHILDREN, AND A CLASSIFICATION OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY—Continued

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N, B .- Index figure indicates the number of pairs of twins included in total number to which it is affixed.

AGE OF SUCH TABLE 183-NUMBER OF HUSBANDS REPORTING CHILDREN AND A CLASSIFICATION BY CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY

CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ON Police, Fire, Health and Street Cleaning Department Funds Combined

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N. B .- Index figure indicates the number of pairs of twins included in total number to which it is affacd,

TABLE 183—NUMBER OF HUSBANDS REPORTING CHILDREN AND A CLASSIFICATION BY AGE OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY—Continued

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Cleaning
Street
pue
Health
Fire,
Police,

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N. B.—Index figure indicates the number of pairs of twins included in total number to which it is affixed.

TABLE 184-NUMBER OF WIDOWERS AND DIVORCEES REPORTING CHILDREN AND A CLASSIFICATION FAMILY ONLY BY AGE OF SUCH CHILD

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ST.	Funds
REN, CONSIDERING THE YOUNGEST CHILD	Department
THE	Cleaning
RING	Street
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	Complete Complete	AGE OF	Number							5 Z	(BER AN	NUMBER AND AGES OF YOUNGEST CHILDREN-LAST BIRTHDAY	or You	NGEST (CHILDR	EN-L	ST BIR	TRDAY							
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TABLE 184-NUMBER OF WIDOWERS AND DIVORCEES REPORTING CHILDREN, AND A CLASSIFICATION BY AGE OF SUCH CHILDREN, CONSIDERING THE YOUNGEST CHILD IN EACH FAMILY ONLY

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N. B.-Index figure indicates number of pairs of twins included in total number to which it is affixed.

PROPORTION OF EMPLOYEES WITH CHILDREN

The probability of an employee or pensioner leaving children to become eligible for pension after his death must be considered before dealing with the ages and the number of such children. If the probable proportion of those dying who leave children below age eighteen—the maximum age limit for children pensions—be developed and then combined with the probability of death, the result will be the probability of the employee leaving at his death children below eighteen years of age. If the employee leave both a widow and children, the children are not eligible for pension unless the mother dies or otherwise becomes removed from the pension roll before they reach the age of eighteen, consequently this contingency must be provided for by considering the probability of her leaving the pension roll between the time of her husband's death and the time when all her children have attained the age of eighteen.

The proportion of employees dying at any one age, who leave children within the pensionable age, has been developed in past valuations of children's benefits, from tables based on all children (similar in form to tables 179 to 181) by methods equivalent to dividing the total number of children reported as being within the age limits of eligibility, by the total number of married men who report children of any age, thus obtaining a ratio. This ratio, which was never used as greater than unity, when multiplied by the proportion that married men with children form of all married men, and then by the proportion that married men represent of all employees, gave the proportion used.

Such a proportion tends to overstate the true value because, for ages at which the number of children within the age of eligibility exceeds the number of married men having children, it could be correct only in case each of the men had at least one child within the age of eligibility, whereas for ages at which the number of children within the age of eligibility is the same as or less than the number of married men having children, it could be correct only in case no two children within the age of eligibility were in the same family. These conditions can hardly be assumed to exist. Had the tabulations dealt only with the youngest child in each family the proportions would have been correct, but because of the absence of such tabulations it was doubtless expedient at that time to use the earlier method. The data collected by the Commission were so secured and so developed by the use of mechanical devices that tables for all children and for youngest children could each be prepared without undue expense. The values have, as previously stated, been developed from the tabulations dealing with the youngest child.

The ease of tabulation made possible, too, the distinction between the families of husbands and those of widowers and divorcees. Data for these two classes have been developed separately.

The Pension Commission developed directly a single proportion to replace the first two factors employed in the previous methods. A specific example of the method followed in developing from the data the unadjusted proportions which were subsequently graduated is shown below. The figures showing the number of fathers are taken from table 180, on

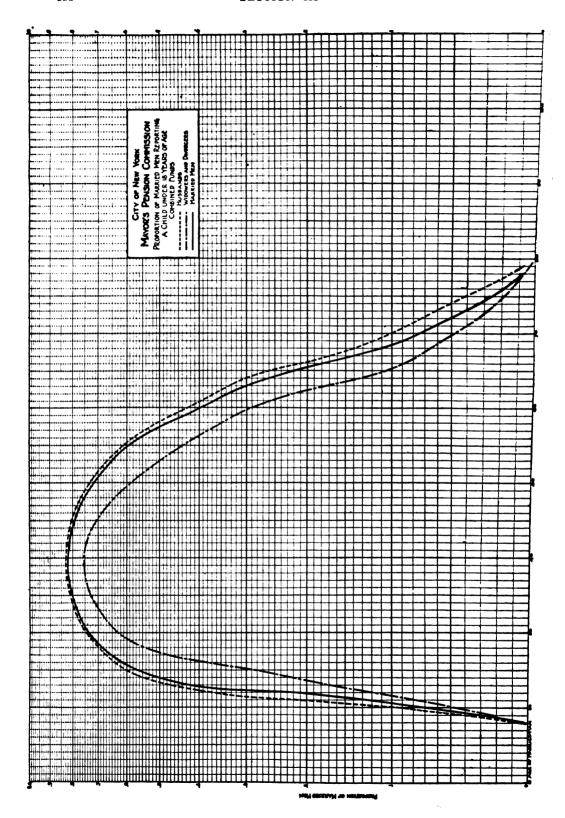
page 324, and the number of children from table 183, on page 330, and relate to the husbands at age 40 who have children within the pensionable limits.

Total youngest children under
18 years of age....=(66+66+49+55+...+2+7+9)=482 =.8324

Total husbands= 579

These proportions were developed separately for the four departments and subsequently the data were all combined and a set developed for general use in valuing all children's benefits. The following three diagrams show (1) the proportions for husbands developed from the combined data, together with the specific proportions for the separate departments; (2) similar proportions for widowers and divorcees, and (3) the two curves for the combined services together with a curve based on all the data, irrespective of the marital condition of the father.

TOTAL SESSE SESSE SESSE



The proportions on which the last diagram was based are given in the following table. The symbol pc_z has been employed as a general symbol to cover the probability of a married man having children within the pension limits, an affix being added, as pc_z^h , pc_z^w , to restrict the probability to a specific marital class. The Commission has no other rates of this nature with which comparisons may be made.

TABLE 185—PROPORTION AMONG ALL MARRIED EM-PLOYEES LEAVING CHILDREN UNDER EIGHTEEN YEARS OF AGE

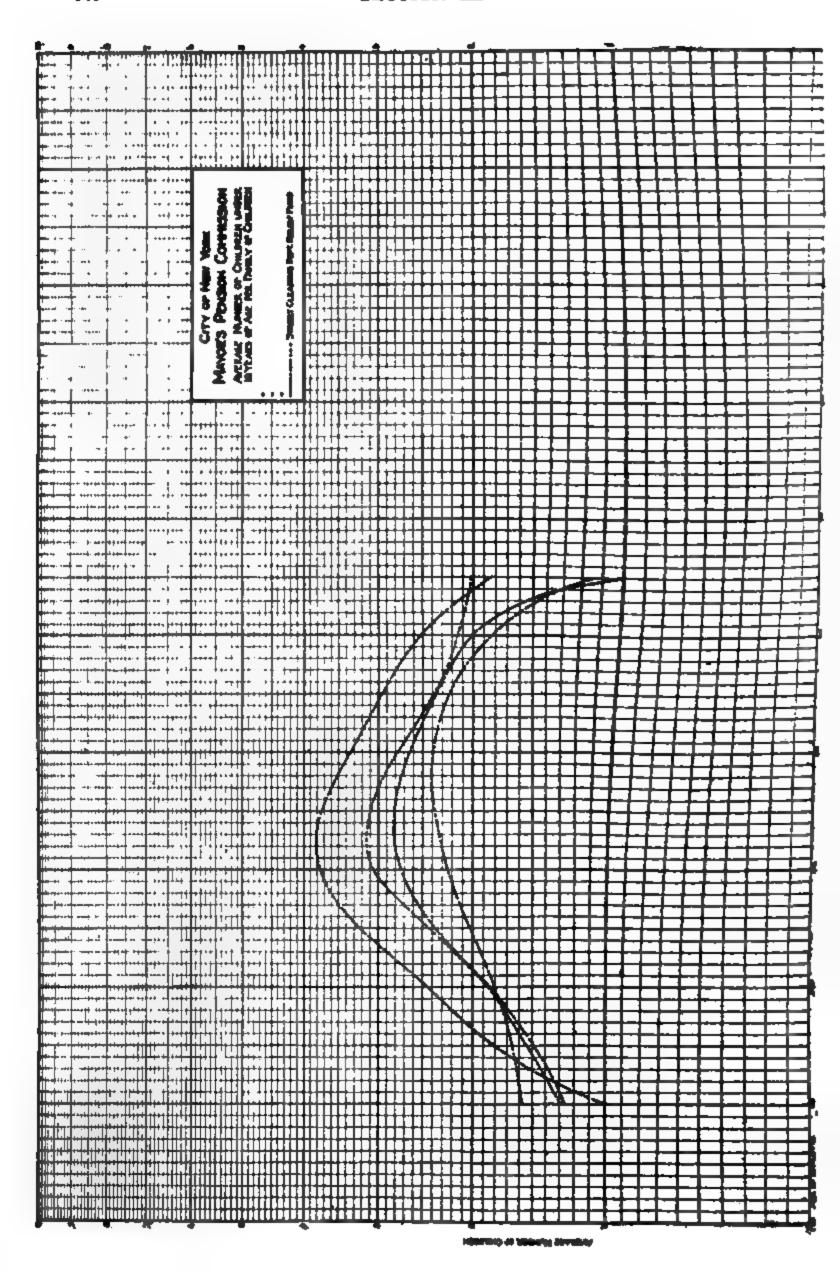
Police	Fire	Health	and	Street	Cleaning	Department	Frede	Combined

AGE	PROPORTION	LEAVING CHI	LDREN UNDER	AGE OF	PROPORTIO	N LEAVING CHI 18 YEARS	LDREN UNDER
FATHER	Married Men	Husbands	Widowers or Divorcees	FATHER	Married Men	Husbands	Widowers or Divorcees
x	pc _z	pch z	pc w	x	pc _z	pch z	pc _x
18	.001	.003	.000	51	.701	.712	. 563
19	.033	.037	.022	52	.678	.602	.533
20	.074	.000	.040	53	.653	.667	.503
21	.127	.100	.08ó	54	.628	.641	.472
22	.215	.358	.120	55	.600	.613	.443
23	.430	.460	.174	56	. 565	. 580	.413
24	.513	.545	.225	57	. 522	-545	. 384
25	.572	.600	. 285	58 I	.475	. 508	.355
26	.621	.639	.385	59	.437	.467	.325
27	.660	.672	.485	60	.402	.428	. 203
28	.693	.700	.550	61	.372	.395	. 262
29	.720	.723	.595	62	.339	.363	.225
30	.743	743	.620	63	.307	.333	. 180
31	.761	.761	.658	64	. 268	.302	. 133
32	.774	.776	.681	65	. 225	.258	. 103
33	. 788	.790	.701	66	. 183	. 206	.088
34	. 798	.800	.716	67	. 140	.167	.077
35	.868	.810	.730	68	.111	.130	.067
36	.814	.817	.741	69	.001	.118	.057
37	.810	.823	.749	70	.076	. 101	.049
38	.823	.826	.754	71	.063	.085	.041
39	.825	.828	.756	72	.052	.072	.034
40	.825	.827	.756	73	.043	.061	.020
41	.823	.826	.754	74	.034	.050	.024
42	.810	.822	.748	75	.026	.041	.020
43	.814	.817	.740	76	.010	.031	.015
44	.807	.810	.727	77	.012	.023	.012
45	.797	.802	.712	78	.006	.015	.007
46	786	.792	.693	79		.007	.004
47	.774	. 782	.672			1	l
48	.758	.760	.645	ll I			
49	.742	.753	.620	ll l		1	
50	.722	733	.591	1 1			1

NUMBER OF CHILDREN PER FAMILY

The average number of children per family is not required for use in the valuation of the pensions allowable under existing laws, but such information is of service in determining the amount of pension which should be allowed to provide for the average family of children.

The following chart shows, for each age of the father, the average number of children under eighteen years of age, per family, in the four departments considered. The curves show a rather marked contrast between the sizes of the families of persons in these departments.



The following are the figures upon which the diagram is based. These averages are derived from total figures, that is, for married men, and are of course computed from the tables showing all children. No comparative figures are available for publication with these results.

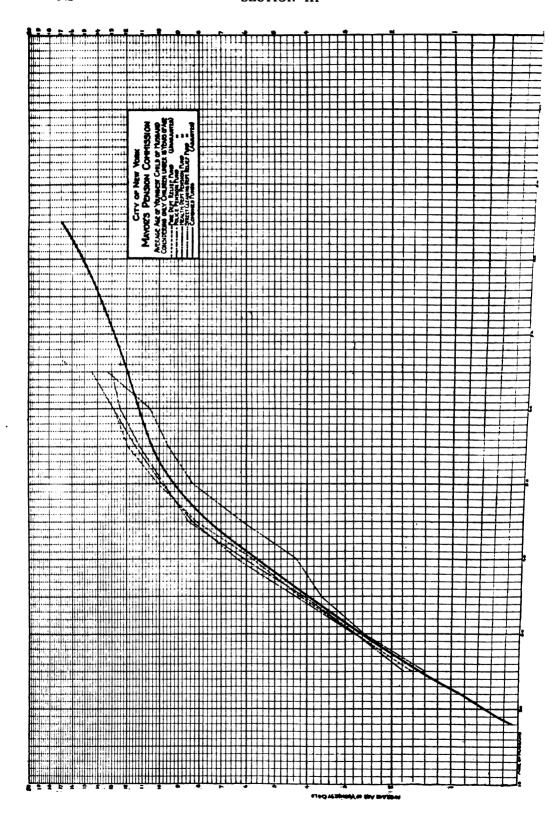
TABLE 186—AVERAGE NUMBER OF CHILDREN UNDER 18
YEARS OF AGE PER FAMILY HAVING CHILDREN

Police	Fire.	Health	and	Street	Cleaning	Department	Funds	Combined	
Fonce.	ruc.	Menu	au.u	Succi	CICHILLIE		r unus	Companied	

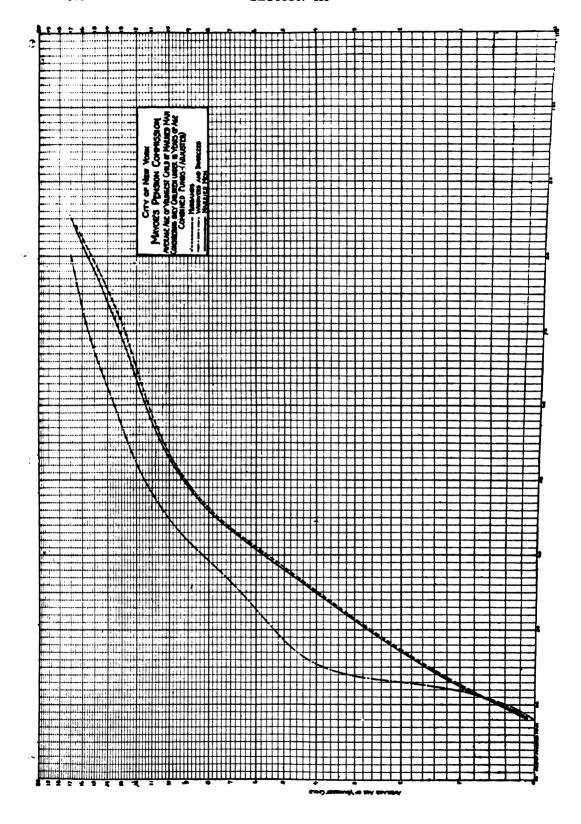
AGE	AVER	GE NUMBE PER FA		.DRBN	AGE	Average Number of Children Per Family			
OF FATHER OF FAMILY	Dept. of St. Clean. Relief & Pension Fund	Fire Depart- ment Relief Fund	Police Pension Fund	Health Depart- ment Pension Fund	OF FATHER OF FAMILY	Dept. of St. Clean. Relief & Pension Fund	Fire Depart- ment Relief Fund	Police Pension Fund	Health Depart- ment Pension Fund
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37	1.00 1.16 1.32 1.49 1.66 1.83 1.98 2.11 2.24 2.35 2.46 2.59 2.74 2.88 3.05 3.24	1.30 1.34 1.39 1.43 1.48 1.53 1.59 1.65 1.72 1.80 1.87 1.96 2.17 2.30 2.44 2.59 2.75	1.28 1.32 1.36 1.41 1.45 1.55 1.62 1.69 1.77 1.85 1.95 2.27 2.38 2.49	1.59 1.60 1.62 1.64 1.65 1.67 1.70 1.72 1.74 1.77 1.80 1.84 1.87 1.92 1.97 2.03 2.07 2.13	43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58	3.82 3.79 3.69 3.62 3.53 3.44 3.35 3.27 3.19 3.96 2.89 2.89 2.74 2.56	3.14 3.13 3.10 3.06 3.02 2.95 2.87 2.79 2.71 2.62 2.55 2.47 2.35 2.30 2.25 2.22	2.81 2.82 2.81 2.79 2.77 2.75 2.72 2.66 2.61 2.56 2.49 2.37 2.32 2.26 2.20 2.14	2.35 2.37 2.39 2.41 2.42 2.43 2.40 2.37 2.35 2.33 2.28 2.18 2.13 2.05 1.86
38 39 40 41 42	3.65 3.73 3.78 3.82 3.83	2.89 3.00 3.08 3.13 3.15	2.64 2.70 2.74 2.77 2.79	2.16 2.21 2.25 2.29 2.33	61 62 63 64 65	2.45 2.33 2.18 2.02 1.85	2.14 2.11 2.07 2.05 2.03	1.93 1.77 1.56 1.26 1.00	1.76 1.64 1.51 1.34 1.17

THE AGE OF YOUNGEST CHILD IN FAMILY

The average age of the youngest child in the family, who is less than eighteen years of age, was computed from the tabulations showing the ages of youngest children only. In preparing the figures the data for fathers within the same five-year groups were combined. The averages were worked for the four departments separately and then compared. The only figures graduated and used in the valuation were those based on the information for all four funds combined. The three following diagrams show (1) the average ages of the youngest children under eighteen years of age of husbands, based on combined data, together with similar unadjusted ages for each of the four departments; (2) similar averages for widowers and divorcees, and (3) the two curves for the combined departments together with a similar curve based on all the data, irrespective of the marital condition of the father.



 $\mathbf{A}_{\mathbf{A}}(\mathbf{x}) = \mathbf{A}_{\mathbf{A}}(\mathbf{x}) + \mathbf{A}$



The following table shows the figures on which the curves in the last chart are based:

TABLE 187—RELATIVE AGE OF YOUNGEST CHILD, UNDER 18 YEARS OF AGE, TO THAT OF FATHER

		AGE OF CHIL	D			AGE OF CHILI	•
AGE OF FATHER	Married Men	Huspands	Widowers and Divorcees	AGE OF FATHER	Married Men	Husbands	Widowers and Divorces
x+34	x'	h _X '	wx'	x+3/2	x'	h ₃₂ ,	wx'
181/2	.21	.22	.08	53 1/2	10.23	10.17	12.17
191/	.40	.42	.26	54 3/2	10.46	10.38	12.39
201/2	.61	.62	.53	55 1/2	10.64	10.57	12.60
21 1/2	.81	.82	1.01	56 1/2	10.85	10.75	12.82
22 1/2	1.02	1.03	1.78	573/2	11.01	10.92	13.03
23 1/2	I.22	1.21	2.86	583/2	II.20	11.08	13.25
24 3/2	1.44	1.44	3.70	59 3/2	11.37	11.22	13.47
251/2	1.67	1.66	4.25	603/2	11.50	11.38	13.60
261/2	1.88	т.88	4.60	61 1/2	11.65	11.50	13.88
271/2	2.12	2.10	4.86	62 3/2	11.80	11.62	14.10
281/2	2.36	2.33	5.07	63 3/2	11.95	11.78	14.28
291/2	2.58	2.56	5.28	64 3/2	12.11	11.91	14.48
301/2	2.82	2.80	5.50	653/2	12.26	12.06	14.67
31 1/2	3.09	3.03	5.71	66 3/2	12.42	12.20	14.83
32 1/2	3 · 37	3.29	5.93	673/2	12.60	12.37	15.02
33 1/2	3.63	3 - 55	6.18	681/2	12.80	12.52	15.22
34 1/2	3.92	3.83	6.44	693/2	12.99	12.70	15.40
351/2	4.23	4.11	6.71	703/2	13.20	12.91	15.59
36 1/2	4 - 54	4.42	7.02	71 3/2	13.42	13.11	15.78
37 1/2	4.88	4 · 75	7 · 37	723/2	13.66	13.32	15.95
38 1/2	5.23	5.10	7.72	731/2	13.89	13.52	16.11
39 1/2	5.59 .	5.48	8.09	743/2	14.17	13.77	16.23
40 1/2	5.96	5.86	8.50	753⁄2	14.40	14.00	16.39
41 3/2	6.35	6.25	8.89	763/2	14.68	14.28	16.51
42 1/2	6.72	6.61	9.30	773/2	14.92	14.55	16.68
43 1/2	7.12	7.02	9.65	783/2	15.21	14.84	16.81
44 1/2	7.50	7.41	9.99	791/2	15.48	15.17	16.95
451/2	7.87	7.80	10.29	80 3/2	15.77	15.48	17.08
46 1/2	8.19	8.14	10.57	811/2	16.02	15.81	17.20
471/2	8.52	8.49	10.80	82 1/2	16.30	16.18	17.33
481/2	8.85	8.82	11.02	831/	16.58	16.48	17.48
491/2	9.18	9.13	11.23	841/2	16.88	16.83	17.61
501/2	9.45	9.41	11.47	851/2	17.21	17.19	17.73
51 3/2	9.73	9.69	11.69	86 1/2	17.56	17.52	17.89
52 1/2	9.99	9.92	11.91	87 1/2	17.95	17.90	

DATA REGARDING EMPLOYEES' DEPENDENT PARENTS

Pensions to dependent parents of employees dying are provided by the four funds. Such benefits are not payable if wife or children survive, and even if there be no such survivors the parent may not be pensioned unless he is considered actually dependent.

The data available for valuing such pensions were extremely meagre but as some estimate of the cost of these benefits was required, it seemed advisable to use the data as being at least indicative of the future rather than to have no basis whatever for an estimate. The reports of pensions to dependent parents were accordingly used as a means of adding facts regarding such parents to the cards for those employees who had died, under conditions which might have given rise to a pension to a dependent parent, and a set of rates were then developed showing the proportion of the employees dying at each age who left parents who were pensioned and the average age of such parents. The following table shows these proportions and average ages which were developed and used in the work. No distinction was made as to whether the pensioned parent was man or woman. However, almost all were women and therefore the pensions of all were valued on the mortality tables applicable to widows.

TABLE 188—PROPORTION OF ALL EMPLOYEES DYING WHO LEAVE DEPENDENT PARENTS ELIGIBLE FOR PENSION WITH THE CORRESPONDING AGE OF SUCH PARENTS

Police, Fire, Health and Street Cleaning Department Funds Combined

Age of Employee at Death $x+\frac{1}{2}$	Proportion Leaving Dependent Parents Preserved	Age of Parent Z	Age of Employee at Death $x+\frac{1}{2}$	Proportion Leaving Dependent Parents	Age of Parent
201/2	. 10750	52.65	401/2	.17575	69.25
21 3/2	.12675	52.87	41 3/2	.22150	69.45
221/2	.15750	53.13	423/2	. 24500	69.85
23 1/2	.23250	53.51	431/2	. 25300	70.40
2436	.30500	54.07	4436	.25150	71.00
253/2	.34500	55.08	451/2	. 24300	71.75
26 3/2	.36400	57.29	461/2	. 22450	72.45
271/2	.36900	59.30	473/2	.19150	73.35
281/2	.36200	60.53	481/2	.14400	74.40
291/2	.34400	61.55	491/2	.09800	75.65
30¾	.31000	62.58	501/2	.06750	77.00
31 1/2	. 24800	63.90	51 1/2	.04850	78.75
32 3/2	.18250	65. 05	523/2	.03565	80.60
331/2	.14650	66.35	53 1/2	.02630	82.75
341/2	.13050	66.85	541/2	.01915	85.35
35 <i>¾</i>	.12200	67.45	551/2	.01365	88.30
36 1/2	.11810	67.58	563/2	.00940	91.50
373/2	.11845	68.30	573/2	.00590	95.25
381/2	.12335	68.6o	58 3/2	.00290	• • •
391/2	. 13675	68.75			• • •

MORTALITY TABLES USED IN VALUING ANNUITIES TO DEPENDENTS

The preceding tables furnish all the necessary family history data for valuing the pension benefits to dependents, excepting those showing the mortality among this class of pensioners. Mortality tables for dependents were prepared by methods similar to those used in developing such tables for other pensioners. The following is a summary of the exposure available.

TABLE 189-SUMMARY OF EXPOSURE-DEPENDENTS

Class	Exposed to Risk	Died	Married and Pensions Revoked
Widows:			1
Police Department	7,263	200	71
Fire Department	3,552	100	21
Health Department	58	. 2	
Street Cleaning Department	120	• • • •	2
Total	10,993	311	94
Children:			1
Police Department	998	4	1
Fire Department	571	ż	
Health Department	3	• • •	
Street Cleaning Department	7	• • •	1
Total	1,579	6	

WIDOWS

The mortality and withdrawal experience of widows on pension was developed separately for the four departments and then combined in a single set of tables applicable to all departments. The following chart shows the rates of separation from the widow's pension roll for each of the three causes—death, remarriage and removal or revocation.

The rates on which the chart is based are given in the following table,

TABLE 190-RATES OF SEPARATION FROM WIDOWS' USED IN THE VALUATION

	RATE	OF DEATH	RATE OF	Remarriage	Rate of
AGE	New York Funds	Widows of Scottish Bankers	New York Funda	Widows of Scottish Banker	Revocation New York Funds
x	₫q ^(w) z	(Hewat)	** ** q (**)	(Hewat)	
19	.0066		.0604	• • • •	. 0320
20	.0068	1	.0523		.0300
21	.0069	.0110	.0452	.0001	.0282
22	.0072	.0110	. 0385	.0015	.0263
23	.0074	.0111	.0330	.0032	.0245
24	.0077	.0111	.0287	.0051	.0227
25	.0079	.0112	.0257	.0072	.0212
26	.0082	.0112	.0230	.0095	.0194
27	.0084	.0113	.0208	.0120	.0178
28	.0088	.0113	.0189	.0145	.0161
29	.0092	.0114	.0173	.0170	.0142
30	.0095	.0114	.0160	.0195	.0123
31	.0098	.0115	.0148	.0220	.0105
32	.0100	.0115	.0138	.0245	.0080
33	.0102	.0116	.0127	.0270	.0080
34	.0104	.0117	.0118	.0270	.0072
35	.0107	.0118	.0108	.0230	.0066
36	.0100	.0110	.0000	.0195	.0062
37	.0112	.0120	.0088	.0165	.0059
38	.0114	.0121	.0077	.0140	.0057
39	.0117	.0122	.0060	.0115	.0054
40	.0121	.0124	.0062	.0000	.0053
41	.0124	.0126	.0055	.0070	.0052
42	.0127	.0128	.0040	.0050	.0050
43	.0132	.0130	.0045	.0035	. 0049
44	.0135	.0132	.0041	.0025	.0048
45	.0138	.0134	.0037	8100.	.0048
46	.0144	.0136	.0034	.0014	.0047
47	.0148	.0138	.0031	.0012	.0047
48	.0154	.0140	.0020	1100.	.0046
49	.0162	.0143	.0027	.0010	.0046
50	.0160	.0147	.0025	.0000	.0046
51	.0176	.0152	.0023	.0008	. 0045
52	.0184	.0158	.0023	.0007	.0045
53	.0106	.0165	.0022	.0006	.0045
54	.0206	.0172	.0010	.0005	.0045
55	.0218	.0172	.0019	.0004	.0045
56	.0231	.0188	.0017	.0003	.0044
57	.0246	.0106	.0015	.0002	. 0044
58	.0262	.0204	.0013	.0002	.0044
59	.0280	.0212	.0013	1000	.0043
0,5	1			1	

together with certain comparative rates taken from other experiences:

PENSION ROLL WITH SIMILAR COMPARATIVE RATES OF OTHER FUNDS

	RATE	OF DEATH	RATE OF	REMARRIAGE	Rate of
AGE x	New York Funds d q (w)	Widows of Scottish Bankers (Hewat)	New York Funds mwq(w)	Widows of Scottish Bankers (Hewat)	Revocation New York Funds rwq(w)
	-	- -		·	
60	.0299	.0220	.0013	.0001	.0043
61	.0321	.0229	.0012		.0043
62	.0343	.0239	.0011	1	.0043
63	.0368	.0250	.0010		.0042
64	.0393	.0262	. 0009		. 004 2
65	.0419	.0277	.0009	•••	.0042
66	.0449	.0296	.0008		.0041
67	.0477	.0320	.0007		.0041
68	.0508	.0370	.0007		.0041
69	.0543	.0420	.0006		.0040
70	.0577	.0470	.0005		.0040
71	.0618	.0520	.0005	l	.0040
72	.0658	.0570	.0004	· · · · ·	.0040
73	.0702	.0620	.0003	1 1	.0039
74	.0748	.0670	.0003	1	.0039
75	.0797	.0720	.0002	1 1	.0039
76	.0848	.0770	.0002	1	.0038
77	.0800	.0830	.0001		.0038
78	.0054	.0800	,0000	l l	.0038
79	.1013	. 0 060		1 1	.0038
80	.1075	.1030		l I	.0038
81	.1143	.1100		1 1	.0037
82	.1212	.1180	• • •	1 1	.0037
83	.1285	.1270	• • •		.0037
84	.1360	.1400	• • •	1 1	.0037
85	.1447	.1600	• • • •	1 1	.0036
86	.1540	.1800	• • • •	1 1	.0036
87	.1638	.2100	• • •	1 1	.0036
88	.1745	.2500	• • •		.0035
89	.1863	.3000	• • •		.0035
90	.2000	.3600	• • • •	1 1	.0035
91	.2170	.4300	• • • •		.0035
92	.2370	.5200	• • • •		.0034
93	.2660	.6500	• • • •	1 1	.0034
94	.3180	.8000		1 1	.0034
95	.4300	1.0000	• • •		.0034
96	.5640	1.5555	• • •		
97	.6840	1 1	• • •		•••
98	.7950		• • •		• • •
99			• • •	'''	•••
100	.9230 I.0000	1	•••	1	• • •
100	1.000		• • •	1 1	• • •

The laws governing the four funds provide that widows' pensions may be revoked in the discretion of the pension granting power. The rate shown in the preceding table shows the experience under these laws during the period under observation. Because discretionary action is involved such a rate is subject to frequent variation and as compared with the other rates used for valuation purposes it is probably very unstable. The employment of this particular rate for the valuation of pensions under a system which gives the employees a definite right in the prospective pensions, not contingent upon the exercise of discretionary powers, would be subject to question. Because of these conditions, two mortality and withdrawal tables have been prepared for the valuation of widows' annuities. One table was prepared by the use of all three rates and the other by the employment of the mortality and marriage rates only. Although the general method used in constructing the first of these tables based on all three rates might have been modified somewhat for use in developing the second based only on the two rates, in order to give greater precision, nevertheless the method was employed without change, since the resulting annuity values were more conservative than those which would have been obtained by the modification. The second table was used throughout in the valuation of prospective pensions and of pensions now in force. Pensions now in force were valued by means of the first table also, but the results are not included in this report. The second table was considered more conservative for use in valuing prospective pensions, since any changes in the pension rules regarding widows' pensions may be expected to restrict rather than to broaden the discretionary power of revocation. The following tables were employed in the valuation work:

TABLE 191-WIDOWS MORTALITY TABLE—COMBINED EXPERIENCE

Police, Fire, Health and Street Cleaning Department Funds
(Table I)

Age	Living living li	Deaths $d_{s}^{(sow)}$	Revocations Causes Other Than Remarriage o (ww) w _z	Re- marriages m (ww) w ₂	Age	Living $l_x^{(ww)}$	Deaths $d_x^{(ww)}$	Revocations Causes Other Than Remarriage (ww) w ₂	Re- marriages m (ww)
19	10,000	66	320	604	59	2,214	62	9	3
20	0,010	62	270	471	60	2,140	64	و ا	3
21	8,207	57	231	37I	61	2,064	66	9	3
22	7,548	54	108	201	62	1,986	68	8	2
23	7,005	52	172	231	63	1,908	70	8	2
24	6,550	50	149	188	64	1,828	72	8	2
25	6,163	49	131	158	65	1,746	73	7	I
26	5,825	48	113	134	66	1,665	75	7	1
27	5,530	46	98	115	67	1,582	75	7 6	I
28	5,271	46	85	100	68	1,499	76		, I
29	5,040	46	72	87	69	1,416	77	6	1
30	4,835	46	60	77	70	1,332	77	5	I
31	4,652	45	49	69	71	1,240	77	5	1
32	4,489	45	40	62	72	1,166	77	5	• • •
33	4,342	44	35	55	73	1,084	76	4	
34	4,208	44	30	50	74	1,004	75	4	• • •
35	4,084	44	27	44	75	925	74	4	
36	3,969	43	25	39	76	847	72	3	
37	3,862	43	23	34	77	772	70	3	
38	3,762	43	21	29	78	699	67	2	
39	3,669	43	20	25	79	630	64	2	1
40	3,581	43	19	23	80	564	61	2	
41	3,496	43	18	19	81	501	57	2	
42	3,416	43	18	17	82 83	442	53	2 1	
43	3,338	44	16	15	84	387	50	i	l ·•
44	3,263	44	16	13	85	336 280	46	l i	
45	3,190	44	15	12	86	246	42 38	;	l
46	3,119	45	15	11	87	207		Î	l
47	3,048	45	14	9	88	172	34 30	i	l ''
48	2,980	46	14	9	89	141	26	l .:	l
49 50	2,911	47	13		90	115	23	.:	l ::
50 51	2,843	48	13	7 6	91	02	20	1 ::	1 ::
51 52	2,775	49	13	6	92	72	17	l ::	l ::
52 53	2,707	50 52	12	5	93	55	14	l ::	I ::
53 54	2,639	52	11	5	94	33	13	1 ::	l ::
55	2,501	55	11	4	95	28	12	l ::	l
56	2,431	56	1 11	7	96	16	9	::	l
57	2,360	58	10	4	97	7	5	l ::	I
58	2,288	60	10	4	98	2	2	l ::	l ::
-	-,	"]	7		_	, -	1	1
====	1	•		<u> </u>	1	'	<u> </u>	<u> </u>	<u> </u>

TABLE 192-WIDOWS MORTALITY TABLE-COMBINED EXPERIENCE

Police, Fire, Health and Street Cleaning Department Funds

(Table II)

AGE	Living $l_{g}^{(w)}$	Deaths $d^{(w)}_{z}$	Remarriages m (w) Ws	AGE	Living (w)	Deaths $d_{z}^{(w)}$	Remarriage ss (sr) ss_s
19	10,000	66	604	60	3,328	100	4
20	9,330	63	488	61	3,224	103	4
21	8,779	61	397	62	3,117	107	
22	8,321	60	320	63	3,007	111	3 3 3 2
23	7,941	59	262	64	2,893	114	1 3
24	7,620	59	219	65	2,776	116	2
25	7,342	58	189	66	2,658	119	2
26	7,095	58	163	67	2,537	121	2
27	6,874	58	143	68	2,414	123	2
28	6,673	58	125	69	2,289	124	1
29	6,490	59	112	70	2,164	125	1
30	6,319	60	101	71	2,038	126	1
31	6,158	60	91	72	1,911	126	1
32	6,007	60	83	73	1,784	125	1
33	5,864	60	74	74	1,658	124	
34	5,730	60	67	75	1,534	122	
35	5,603	60	61	76	1,412	120	·
36	5,482	60	54	77	1,292	116	
37	5,368	60	47	78	1,176	112	1
38	5,261	60	41	79	1,064	108	
39	5,160	60	36	80	956	103	
40	5,064	61	31	81	853	97	
41	4,972	62	27	82	756	92	1
42	4,883	62	24	83	664	85	
43	4,797	63	21	84	579	79	
44	4,713	64	19	85	500	72	1
45	4,630	64	17	86	428	66	
46	4,549	65	16	87	362	59	
47	4,468	66	14	88	303	53	1
48	4,388	68	13	89	250	47	
49	4,307	70	12	90	203	41	
50	4,225	71	11	91	162	35	
51	4,143	73	10	92	127	30	
52	4,060	75	9	93	97	26	1
53	3,976	78		94	71	23	
54	3,890	80	7	95	48	21	
55	3,803	83	7 6	96	27	15	
56	3,713	86	6	97	12	8	1
57	3,621	89	6	98	4	3	
58	3,526	92	5	99	. т	I	
59	3,429	96	5			• • •	

The following table gives the expectation of life and the annuity values based on the preceding tables:

TABLE 193—THE ANNUITY VALUES AND EXPECTATIONS OF PENSION APPLICABLE TO WIDOW PENSIONERS

Computed for Both Widows' Mortality Tables.

AGE	Annuity Pension S Termina	UBJECT TO	Expect/Penson S Pension S Termin/	SION	Age	PENSION S	VALUE UBJECT TO	Pen Pension S	ATION OF SION - SUBJECT TO ATION BY
<i>x</i>	Death Marriage	Death Marriage Revocation	Death Marriage	Death Marriage Revocation	x	Death Marriage	Death Marriage Revocation	Death Marriage	Death Marriage Revocation
19	13.355	10.588	27.425	20.104	59	10.592	10.210	15.280	14.611
20	13.829	11.145	28.359	21.358	60	10.314	9.96ó	14.728	14.103
21	14.233	11.653	29.107	22.398	61	10.036	9.700	14.187	13.603
22	14.568	12.112	29.682	23.310	62	9.758	9.442	13.657	13.114
23	14.831	12.514	30.078	24.079	63	9.480	9.183	13.138	12.634
24	15.032	12.861	30.323	24.716	64	9.208	8.926	12.636	12.166
25	15.186	13.163	30.454	25.237	65	8.937	8.671	12.148	11.709
26	15.305	13.434	30.496	25.671	66	8.665	8.415	11.665	11.260
27 28	15.392	13.668	30.461	26.013	68	8.396	8.164	11.197	10.824
26 29	15.454	14.041	30.363	26.271 26.451	69	8.130 7.860	7.911 7.661	10.742	9.978
30	15.512	14.170	30.000	26.550	70	7.607	7.414	0.868	9.571
31	15.521	14.286	20.781	26.574	71	7.348	7.168	9.447	0.173
32	15.515	14.350	29.517	26.522	72	7.005	6.927	9.042	8.789
33	15.496	14.401	20.224	26.403	73	6.847	6.676	8.650	8.414
34	15.461	14.418	28.896	26.220	74	6.602	6.452	8.269	8.051
35	15.412	14.413	28.540	26.000	75	6.360	6.220	7.897	7.699
36	15.350	14.388	28.159	25.746	76	6.121	5.994	7.536	7.358
37	15.272	14.345	27.746	25.447	77	5.889	5.770	7.190	7.026
38	15.176	14.281	27.300	25.111	78	5.657	5 - 549	6.849	6.702
39	15.062	14.197	26.825	24.736	79	5 - 427	5.329	6.518	6.385
40	14.931	14.005	26.324	24.333	80	5.203	5.112	6.198	6.076
41	14.786	13.980	25.802	23.907	81 82	4.983	4.897	5.886	5.774
42 43	14.628	13.850	25.263 24.707	23.460	83	4.761	4.685	5.577	5.481
44 44	14.457 14.274	13.705	24.707	22.991	84	4 - 544	4.474	5.280 4.982	5.192 4.006
45	14.081	13.384	23.562	22.015	85	4.324	4.047	4.600	4.621
46	13.876	13.205	22.073	21.383	86	3.881	3.832	4.395	4.338
47	13.663	13.018	22.380	20.490	87	3.658	3.614	4.105	4.057
48	13.440	12.819	21.770	20.464	88	3.420	3.390	3.807	3.773
49	13.210	12.613	21.170	19.932	89	3.182	3.157	3.508	3.482
50	12.975	12.400	20.580	19.400	90	2.935	2.911	3.204	3.180
51	12.731	12.180	19.978	18.864	91	2.671	2.649	2.889	2.867
52	12.480	11.952	19.376	18.324	92	2.384	2.365	2.547	2.534
53	12.223	11.717	18.775	17.783	93	2.061	2.052	2.180	2.175
54	11.961	11.478	18.179	16.746	94	1.719	1.710	1.796	1.793
55	11.692	11.233	17.583	16.710	95 96	1.371	1.352	1.417	1.403
56 57	11.422	10.985	16.997	16.178	97	1.103	1.068 .861	1.130	1.000
57 58	11.148	10.732	16.417	15.649 15.126	98	.907	.678	.917	.879
30	10.072	10.477	13.045	1 -2.140	30	.722	.078	.750	.690

CHILDREN

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The experience covering children's mortality was so limited that it seemed advisable to adopt rates from another experience. The data available were in fact hardly sufficient even to indicate the form of the curve which would reflect the future trend, consequently the rates from various tables considered for adoption were multiplied into the exposed to risk column and the expected deaths thus obtained checked in total with the

actual deaths. A table developed by Archibald Hewat from the experience of Scottish Ministers' Widows' and Orphans' Fund of Scotland, was finally adopted. Although the number of children on the pension rolls of the Ministers' Fund was not so large as the number on the New York roll, the period of observation was very much longer. The expected deaths by use of the adopted rates accumulated to 5.7 while the actual number recorded was 6. Because of this close agreement between the two experiences the use of the adopted table seemed advisable until such time as the entire experience of the children's pension roll could be compiled. The following table contains certain values taken from Mr. Hewat's table as it appears in his account of the valuation of the Scottish Ministers' Widows' and Orphans' Fund. A column has been added to show the term life annuity values based on this table, which have been employed in the valuation work.

TABLE 194—CHILDREN PENSIONERS' MORTALITY TABLE WITH THE ADDITION OF THE RATE OF DEATH AND TERM ANNUITY VALUES

Age #	Number Living l ^(c)	Number Dying d _z (c)	Death Rate 4 (c) q_x	Term Annuity $\bar{d}_{z}^{(c)}$
0	1,000,000	61,933	.0619	11.548
1	938,067	14,720	.0157	11.748
2	923,347	8,705	.0095	11.384
3	914,642	7,668	.0084	10.928
4	906,974	7,015	.0077	10.436
5	899,959	6,120	.0068	9.914
3 4 5 6 7	893,839	5,184	.0058	9.358
7	888.655	4.265	.0048	8.766
8 9	884,390	3,802	.0044	8.138
9	880,498	3,609	.0041	7 - 479
10	876,880	3,508	.0040	6.788
11	873,381	3,057	.0035	6.066
12	870,324	2,437	.0028	5.309
13	867,887	1,909	.0022	4.515
14	865,978	1,559	.0018	3.685
15	864,419	1,988	.0023	2.818
16	862,431	2,932	.0034	1.916
17	859,499	4,814	.0056	.978

DEPENDENT PARENTS

The mortality of dependent parents was considered as being the same as that of widows at corresponding ages.

DERIVATION OF MONETARY VALUES FOR USE IN VALUATION

The basic tables required in deriving the monetary values for pensions to dependents have all been given; there only remains to be shown the methods of combining values from these tables used in the actual calculations. In the presentation of these methods the benefits to each class of dependents have been considered separately in order to avoid confusion. Certain general values which were used more or less frequently in the work and which are of general use are included in the discussion.

WIDOWS

The survivorship or reversionary benefits to the widows of pensioners now on the rolls, who are husbands, might have been valued by means of joint life tables if the exact ages of the members and their wives had been available,* but such a procedure could not be directly used for valuing prospective pensions to those employees now in the active force who are unmarried. Because of this fact another method was employed uniformly in valuing all widow's benefits.

- (A) The present value in respect to a regular or service pensioner now on the roll at age x, of a pension of one to his widow, was developed as follows:
 - $l_x^{(p)}$ = number living at age x, according to the regular pensioners' table.
 - $d_x^{(p)}$ = number dying between the ages of x and x + 1 according to the same table.
 - y =exact age of wife left by husband dying between the ages of x and x + 1.
 - $\bar{a}_y^{(w)} = \text{continuous annuity on life of widow at age } y \text{ terminable on death or remarriage.}$
 - pm_x^{λ} = proportion of employees or pensioners at age x, who are husbands.

The symbol " ω " will be used throughout to indicate the highest age shown in the table being considered.

$$\begin{split} \overline{W}\overline{C}_x^{(p)} &= d_x^{(p)} \cdot v^{e+\frac{1}{2}} \cdot pm_{x+\frac{1}{2}}^h \cdot \bar{a}_y^{(w)} \\ \\ \overline{W}\overline{M}_x^{(p)} &= \sum_{n=x}^{\infty} \overline{W}\overline{C}_x^{(p)} \\ \\ D_x^{(p)} &= V_x^{(p)} \cdot v^n \end{split}$$

 $\frac{\overline{w}\overline{M}_{z}^{(p)}}{D_{z}^{(p)}}$ = present value of annuity of one to widow.

$$\therefore \frac{{}^w\overline{M}_x^{(p)}}{D_x^{(p)}} \begin{bmatrix} \text{Number of regular} \\ \text{pensioners on the} \\ \text{roll at age } x \end{bmatrix} \begin{bmatrix} \text{Average amount of} \\ \text{pension payable} \\ \text{to widow} \end{bmatrix}$$

= present value of future pensions to widows of regular pensioners now on the roll at age x.

Similarly the value

$$\frac{\overline{w}M_{\bullet}^{(i)}}{D^{(i)}}$$

was developed for use in valuing pensions to the widows of disability pensioners now on the roll.

^{*}The records of the marital condition of members on pension were not used as a basis for other than study figures, as these records are not always corrected to date.

- (B) The present value in respect to an active employee at age x, of a pension of one to his widow, should he be killed in actual performance of duty, was developed as follows:
 - $l_x^{(0)}$ = number living at age x, according to the active service table.
 - ${}^{a}d_{a}^{(a)}$ = number of active employees dying in actual performance of duty between the ages of x and x+1, according to the active service table.

$$\begin{array}{l} \overset{\text{\tiny od}}{=} \overline{C}_{s}^{(a)} = \overset{\text{\tiny od}}{=} d_{s}^{(a)} \cdot v^{s+\frac{1}{2}} \cdot pm_{s+\frac{1}{2}}^{h} \cdot \overline{d}_{y}^{(a)} \\ \\ \overset{\text{\tiny od}}{=} \overline{M}_{s}^{(a)} = \sum_{s=s}^{s=s} \overset{\text{\tiny od}}{=} \overline{C}_{s}^{(a)} \\ \\ D_{s}^{(a)} = I_{s}^{(a)} \cdot v^{s} \end{array}$$

 $\frac{\sim_{W} \overline{M}_{x}^{(a)}}{D_{x}^{(a)}}$ = present value of annuity of one to widow.

$$\therefore \frac{A_{\overline{M}}(a)}{\overline{D}_{x}^{(a)}} \begin{bmatrix} \text{Number of active} \\ \text{employees in the} \\ \text{force at age } x \end{bmatrix} \begin{bmatrix} \text{Average amount} \\ \text{of pension payable to widow} \end{bmatrix}$$

= present value of future pensions to widows of members now in the active force at age x who will be killed in the actual performance of duty.

Similarly by use of the ${}^od_{\frac{x}{2}}^{(0)}$ column instead of the ${}^od_{\frac{x}{2}}^{(0)}$ column, a value may be developed covering deaths which occur in active service from causes not having their origin in the actual performance of duty. This value developed similarly on a basis of one would be

$$\frac{{}^{\operatorname{ad}} W \overline{M}_{x}^{(a)}}{\overline{D}_{x}^{(a)}}$$

Attention is called to the fact that these columnar values and the succeeding columnar values derived in this section of the report may be handled as are similar commutation columns based on ordinary life tables. For example, if the widow were pensionable only in case her husband died in actual performance of duty, and in case the husband died from other causes, only after he had had ten years' service, then the value for an employee at age x who had had three years of service would be

$$\frac{{}^{ad} \overline{M}_{x}^{(a)} + {}^{bd} \overline{M}_{x+7}^{(a)}}{D_{x}^{(a)}}$$

- (C) The preceding illustrations show the general type of calculations required with the exception of that to determine the value in respect to a member now in the active force at age x, of a pension of one to his widow if he die after leaving the active service on pension. Disability pensions and regular pensions require separate development. The value for disability pensions was derived as follows:
 - $r_a^{(a)}$ = number of disability retirements of active employees between the ages of x and x + 1.

$$\label{eq:continuous_continuous$$

 $\frac{G_{W}\overline{M}_{z}^{(a)}}{D_{z}^{(a)}}$ = present value of annuity of one to the widow.

$$\therefore \frac{{}^{\iota_{r}|_{W}}\overline{M}_{x}^{(o)}}{D_{x}^{(o)}} \begin{bmatrix} \text{Number of employees} \\ \text{in the active force} \\ \text{at age } x \end{bmatrix} \begin{bmatrix} \text{Average amount of} \\ \text{pension payable} \\ \text{to widow} \end{bmatrix}$$

= present value of future pensions to widows of members now in the active service at age x who will die after being retired on disability pensions.

A similar formula may be applied in developing the values of the . pensions to the prospective widows of employees now on the active rolls who will die as regular or service pensioners, but the formula is applicable only if the pension plan provides the same benefit for the widows of persons dying on the pension rolls as it gives to widows of persons dying in the active service, and if it is unnecessary to state separately the value of the pensions to the two classes of widows. If the pension plan allow a larger benefit to one class than to the other, or if for any reason the values of the pensions to the two classes must be accurately stated separately, further refinement is necessary in the formula. As has been explained at length on page 36, it seems advisable, in order to secure greater accuracy in deriving rates of retirement on regular or service pensions, to assume that certain persons, who were shown by the actual experience tables to have retired on regular or service pensions, remained in the active service until a later age. The deaths that occurred among this group thus treated were, however, regarded as deaths of persons on pension, since as the benefits to the two classes of widows were the same it made no difference in the result. Had the benefits been different, the correct number of deaths would have to be deducted from deaths of persons on pension and added to the deaths in the active service. The formulæ throughout must of course be consistent with the provisions of the fund.

Because of their general application in the development of the formulæ presented above the tabular values of $\bar{a}_y^{(w)}$ and $(v^{x+y_1} \cdot pm_{x+y_1}^h \cdot \bar{a}_y^{(w)})$ for each age of the husband are given.

TABLE 195—CERTAIN TABULAR VALUES USED IN THE VALUATION OF WIDOWS' BENEFITS

Age of Husband #+1/2	ā(w	$\begin{bmatrix} v^{x+\lambda_i} \cdot pm_{x+\lambda_i}^h \\ \vdots \\ a^{(w)} \end{bmatrix}$	Age of Husband	ā(w)	$\begin{bmatrix} [p^{x+\frac{1}{2}}.pm_{x+\frac{1}{2}}^{n}] \\ .\overline{a}_{y}^{(w)} \end{bmatrix}$
191/		-	601/2	11.830	. 87997
201/2	13.940 14.100	.42278	611/4	11.530	.81904
21 1/2	14.260	.70506	62 1/2	11.355	. 76230
22 1/2	14.400	1.00660	631/4	11.125	.71702
231/2	14.560	1.52694	6434	10.000	.65542
24 1/2	14.680	1.90739	6534	10.650	.60475
251/2	14.825	2.25322	661/2	10.390	- 55539
261/2	14.950	2.52588	671/2	10.150	. 50796
27 1/2	15.060	2.75851	681/2	9.890	.46198
28 1/2	15.150	2.96625	6914	9.650	.42089
2934	15.240	3.11220	701/2	9.380	.38175
30 1/2	15.310	3.17668	7114	9.130	. 34648
311/2	15.360	3.18659	721/	8.870	.31373 .28319
32 1/4 33 1/4	15.395	3.17235	73½ 74½	8.600	.25474
341/4	15.415	3.13819 3.09380	751/2	8.320 8.060	. 22909
351/2	15.425 15.420	3.03841	761/2	7.780	.20529
361/2	15.395	2.96868	77 1/2	7.525	. 18403
371/2	15.365	2.89112	7834	7.260	. 16414
381/2	15.325	2.80548	791/2	6.990	.14571
391/2	15.265	2.71300	801/2	6.730	. 12888
401/2	15.180	2.61505	81 1/2	6.480	. 11356
41 1/2	15.100	2.51650	821/2	6.215	.09925
42 1/2	15.000	2.41529	83 1/2	5.960	.08642
431/2	14.890	2.31429	841/2	5.690	.07461
4434	14.765	2.21265	85 1/2	5.440	. 06400
451/2	14.640	2.11347	861/2	5.190	.05419 .04568
461/2	14.510	2.01637	871/2	4.960	.03804
473/2	14.350	1.91811	881/2	4.725	.03125
48½ 49½	14.200 14.050	1.82399	89½ 90½	4.500 4.280	.02551
501/2	13.870	1.64136	911/2	4.080	.02079
511/2	13.600	1.55331	921/2	3.870	.01675
5234	13.490	1.46589	931/2	3.680	.01339
531/2	13.315	1.38412	9414	3.500	.01044
541/2	13.120	1.30373	9534	3.300	.00748
551/2	12.025	1.22680	961/2	3.130	.00547
561/	12.725	1.15291	971/2	2.960	.00365
573/2	12.505	1.08035	981/2	2.790	.00208
581/2	12.200	1.01127	991/2	2.640	.00072
591/2	12.060	.94402		l l	• • •

CHILDREN

The valuation of pension benefits to children, though representing the smallest liability for any one class of pensioners, with the exception of dependent parents, involved the greatest amount of labor. Such values involve not only all the probabilities required for valuing employees' pensions, and all those employed in the valuation of widows' pensions, but in addition all the probabilities which must be considered regarding the chances of issue and the ages and number of the children at the moment of death. Considering the same classes of employee pensioners and of active members, as were discussed in regard to widows' benefits we may develop the values of children's pensions.

- (D) The present value in respect to a regular or service pensioner now on the roll at age x, of a pension of one to his children, commencing at his death, if their mother be dead, or on her removal from the pension roll, if she survive him, to continue until all the children have attained age eighteen, was developed as follows:
 - x' =average age of youngest child of husband dying between the ages of x and x + 1.
 - "x' = average age of youngest child of widower dying between the ages of x and x + 1.
- pc_x^h = proportion of husbands at age x, who have children under age 18.
- pc_x^w = proportion of widowers and divorcees at age x, who have children under age 18.

In view of the fact that the average family has more than one child, the assumption has been made that in case the youngest child dies the next older will replace him and so on, so that the term annuities to families of children have been valued as annuities certain.

- $18 {}^{h}x' = \text{term for which annuity might become payable to}$ children of husband.
- 18 x' = term for which annuity might become payable to children of widower or divorcee.

$$\bar{a}_{18-\Lambda a'} = \frac{1}{2} + a_{18-\Lambda a'-\frac{1}{2}}$$

$$\bar{a}_{18-w_{g'}} = \frac{1}{2} + a_{18-w_{g'}-\frac{1}{2}}.$$

- $a_{y}^{(w)} = \frac{1}{2} + a_{y}^{(w)} = \frac{1}{2} + a_{y}^{(w)} = \text{term annuity on wife's life during period } 18 a_{x}^{(w)}$ after husband's death.
- $\bar{a}_{15 \to w'} {}_{15 \to w'} \bar{a}_{y}^{(w)} = \text{value of reversionary term annuity of one}$ to children of husband dying.
- $l_x^{(p)}$ = number living at age x according to the regular pensioners' table.
- $d_x^{(p)}$ = number dying between ages x and x + 1 according to the regular pensioners' table.

$$d_x^{(p)} \cdot v^{\frac{1}{2}} \cdot pm_{x+\frac{1}{2}}^w \cdot pc_{x+\frac{1}{2}}^w \cdot \overline{a_{18-w_{x'}}}$$

= present value at age x of annuities to children of widowers dying during the year, out of $l_x^{(p)}$ pensioners living at the beginning of the year.

$$d_n^{(o)} \cdot v^{\perp} \cdot pm_{n+1}^{\lambda} \cdot pc_{n+1}^{\lambda} \cdot [\bar{a}_{10-10}] - [\bar{a}_{10-10}]$$

= present value at age x of reversionary term annuities to children of husbands dying during the year, out of $I_x^{(p)}$ pensioners living at the beginning of the year.

$$\begin{array}{c} {}^{h+w}\operatorname{ra}(\mathfrak{u})\overline{C}_{s}^{(p)}=d_{s}^{(p)}\cdot v^{s+\frac{1}{2}}\cdot [pm_{s+\frac{1}{2}}^{w}\cdot pc_{s+\frac{1}{2}}^{w}\cdot \bar{a}_{\overline{18-w}}]\\ \\ \qquad \qquad +pm_{s+\frac{1}{2}}^{h}\cdot pc_{s+\frac{1}{2}}^{h}\cdot (\bar{a}_{\overline{18-k}}-c_{s})\\ {}^{h+w}\operatorname{ra}(\mathfrak{u})\overline{M}_{s}^{(p)}=\sum_{s=s}^{n-w}{}^{h+w}\operatorname{ra}(\mathfrak{u})\overline{C}_{s}^{(p)}\\ \\ D_{s}^{(p)}=l_{s}^{(p)}\cdot v^{s} \end{array}$$

 $\frac{\sum_{p=0}^{n} \overline{M}_{p}^{(p)}}{D_{p}^{(p)}} = \text{present value of an annuity of one to children}$

$$\therefore \frac{\sum_{p=0}^{n} \overline{D}_{p}^{(p)}}{D_{p}^{(p)}} \begin{bmatrix} \text{Number of regular pensioners} \\ \text{lar pensioners} \\ \text{at age } x \end{bmatrix} \begin{bmatrix} \text{Average amount of pension payable to children} \end{bmatrix}$$

= present value of future pensions to children of regular pensioners now on roll at age x.

A similar development gives the values used in regard to disability pensioners.

(E) The present value in respect to an active employee at age x, of a pension of one to his children, commencing on his death in actual performance of duty, if their mother be dead, or on her removal from the pension roll if she survive his accidental death, to continue until all the children have attained age eighteen, was computed as follows:

 $\frac{e^{ak+a} ran \overline{M}_x^{(a)}}{D_x^{(a)}} = \text{present value of an annuity of one to children.}$

$$\frac{ {}^{\bullet_d h + w} YQ(15) \overline{M}_x^{(a)} }{D_x^{(a)}} \begin{bmatrix} \text{Number of employees} \\ \text{in the active service} \\ \text{at age } x \end{bmatrix} \begin{bmatrix} \text{Average amount of pensions payable} \\ \text{to children} \end{bmatrix}$$

= present value of future pensions to children of members now in the active force at age x, who will be killed in performance of duty.

Similar values may be developed on the ${}^{\circ}d_{z}^{(a)}$ column of the active service table. The derived values may be employed in the same manner as those used for widows' benefits and limitations as to the employee's service before death, etc., may be accounted for by similar combinations of the values.

(F) The preceding values cover the general type of the calculations required, with the exception of the value in respect to a member now in the force at age x, of a pension of one to his children if he die after leaving the active force on pension. Considering the general limitations that the pension to the children is not payable unless both mother and father have been removed from the pension roll, the value covering the employee's death after disability retirement was derived as follows:

 $f_x^{(a)}$ = number of disability retirements of active employees between the ages of x and x + 1.

$$\frac{i_{r|h+\varpi} \operatorname{rais}(\overline{C}_{x}^{(a)})}{\overline{C}_{x}^{(a)}} = i_{x}^{(a)} \cdot v^{o+\frac{1}{2}} \cdot \frac{1}{2} \left(\frac{\frac{h+\varpi \operatorname{rais}(\overline{M}_{x}^{(i)})}{\overline{D}_{x}^{(i)}} + \frac{h+\varpi \operatorname{rais}(\overline{M}_{x+1}^{(i)})}{\overline{D}_{x+1}^{(i)}} \right).$$

$$\frac{i_{r|h+\varpi} \operatorname{rais}(\overline{M}_{x}^{(a)})}{\overline{D}_{x}^{(a)}} = \sum_{n=x}^{\infty} i_{r|h+\varpi} \operatorname{rais}(\overline{C}_{x}^{(a)}).$$

$$\frac{i_{r|h+\varpi} \operatorname{rais}(\overline{M}_{x}^{(a)})}{\overline{D}_{x}^{(a)}} = \text{present value of an annuity of one to children.}$$

$$\frac{{}^{4_{r}|^{\lambda+w}} r \alpha_{\text{UB}} \overline{M}_{x}^{(a)}}{D_{x}^{(a)}} \begin{bmatrix} \text{Number of employees} \\ \text{in the active force} \\ \text{at age } x \end{bmatrix} \begin{bmatrix} \text{Average amount of} \\ \text{pension payable} \\ \text{to children} \end{bmatrix}$$

= present value of future pensions to children of members now in the active force at age x who will die after being retired on disability pension.

Similar values were developed covering members dying after being retired on regular service pensions. These values are affected by the conditions of retirement in the same manner as are the widows' pension benefits.

Because of their general application in the development of the formulæ presented above, the tabular values of

$$\begin{array}{c} [pm_{z+1}^{h}\cdot pc_{z+1}^{h}\cdot (\vec{a}_{13-4\sigma})-_{\lfloor 13-4\sigma}\vec{a}_{y})]\\ \text{and}\\ [pm_{z+1}^{o}\cdot pc_{z+1}^{o}\cdot \vec{a}_{13-4\sigma}] \end{array}$$

for each age of the father are given.

BENEFITS	×++ 2 [(2)+(q)]	હ	.06903	.06283	.05678	.05142	.04625	.04151	.03730	.03287	.02850	.02417	.02003	.01678	.01341	OIIIO.	60600.	.00757	.00625	.00522	01400.	.00332	1/200.	.00212	09100.	.00124	40000	29000.	.00043	.00035	92000	91000	01000	80000	10000
CHILDREN'S B	[bm + 3, 6, 2+16]	૭	. 26684	. 26048	. 25392	.24581	. 23634	. 22534	.21572	. 20005	.18209	.15765	13195	00011.	00680.	.07449	.06388	.05530	.04784	.04167	.03554	.02975	.02531	12020.	.01657	.01202	84600.	.00728	,00506	.00421	.00320	.00228	01100	A 3000	70000
VALUATION OF	$\left[\frac{p^{m}}{a^{\frac{1}{16-h}z'}} + \beta c^{h}_{z+\frac{1}{16-h}z'\frac{1}{a}}\right]$	<u> </u>	.27428	93169	.22748	.20758	.18777	.17056	.15425	.13807	.12369	96111.	.10049	18680.	.07924	.07041	.05950	.05158	.04389	.03796	.03102	.02507	.02126	.01765	.01308	86010.	10000.	.00664	.00419	.00377	.00270	1,000.	18000.	.00018	81000.
IN THE	Age of Father x+1/5	છ	52%	53%	54%	55%	26%	57.%	58%	59%	209	61%	62%	63%	64 %	65%	×99	67.72	68%	269	70%	11%	72%	73%	74%	75%	76%	77%	78%	79%	80 %	81%	82%	83%	2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2
ABULAR VALUES USED I	%+ sa[(2)+ (q)]	છ	.00077	.03102	92650.	.09872	.14134	17866	.21201	. 23882	.26081	. 27902	. 28984	. 29251	. 29060	. 28579	. 27813	. 26758	25485	. 24093	. 22668	.21171	.19866	.18478	.17163	.15944	69941.	.13634	.12596	. 11667	71701.	4 0660.	.09052	.08304	.07592
H	$[pm \stackrel{w}{z} + y; pc \stackrel{w}{z} + y;$ $\frac{a}{a} \stackrel{m}{1s^{-k}s'}]$	৩	.00113	.00232	.00387	.00631	40000.	01530	.02268	.03416	04519	40950	96020.	82,80.	.10758	.12892	.14862	16614	. 18346	19887	.21517	. 22908	. 24079	. 25103	. 26039	. 26620	. 26858	. 27362	.27562	. 27686	01772.	27802	. 27668	27203	
TABLE 196—CERTAIN	$\frac{[pm_{x}^{h};pc_{x};\varphi}{(\bar{a}\frac{1}{1e^{-h_{x}} - _{1s^{-h_{x}}}\bar{a}_{y}})]}$	 (9)	08010.	.06700	.13501	.23227	.34532	45174	.55369	.64107	.72172	.79634	.85085	87984	89206	.89349	.88622	.86923	.84211	.80947	.77150	.72921	.69446	.65367	.61354	.57813	. 53928	. 50729	.47469	.44595	.41338	.38559	.35414	.30018	
T	Age of Father x+1%	(8)	19%	20%	21%	22%	23%	24.X	25%	26%	27.%	28%	29%	30%	31%	32%	33%	34%	35%	36%	37%	38%	39%	4 0%	41%	42%	43%	1	45%	46 %	Z. Z.	2,04	20%	51%	

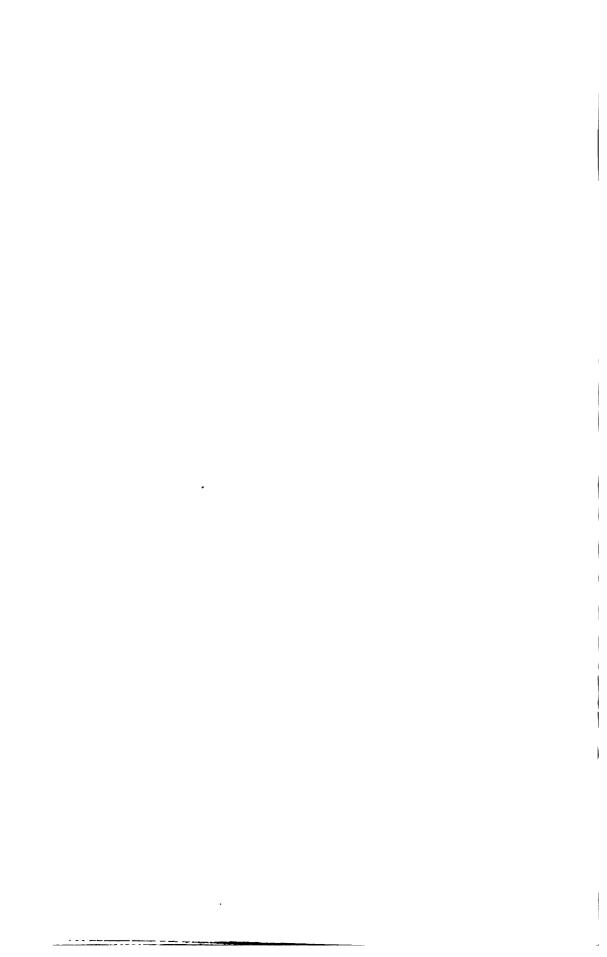
DEPENDENT PARENTS

Pensions to dependent parents were valued by the same methods as those used in valuing widows' pensions. The only differences in the formulæ are that the proportion of employees leaving dependent parents was substituted for the proportion who are husbands, and the ages and corresponding annuity values of dependent parents were used in place of the ages of wives.

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SECTION IV

VALUATION OF ALL FUNDS, INCLUDING CERTAIN TABLES
OF RATES AND VALUES FOR COMPARISON BETWEEN
INDIVIDUAL FUNDS



VALUATION OF ALL FUNDS, INCLUDING CERTAIN TABLES OF RATES AND VALUES FOR COMPARISON BETWEEN INDIVIDUAL FUNDS

The general methods employed in valuing the assets and liabilities of the funds and such facts regarding each individual fund as seemed to require separate consideration have been discussed in the preceding sections of this report. In this section such material is brought together as seems essential for a consideration of the different funds as component parts of a single pension system of the city. The facts relating to a specific fund are, therefore, treated in this section of the report only in so far as they show the relation of that fund to the other funds or to the entire pension system of the municipality. The conditions of service and the pension benefits applicable to the various classes of employees are contrasted and the aggregate assets and liabilities of the entire pension system are presented.

COMPARISON OF MORTALITY AND SERVICE RATES EMPLOYED

In tables 197 to 207 are presented the various rates of separation from the active service and of pensioners' mortality that have been used in the present report, arranged to facilitate comparison between the different funds and branches. The order in which the rates for the several funds have been arranged in the tables has been determined separately for each table, according to the magnitude of the rates, so that the figures for the fund which has the highest total rate from the cause shown occupy the first, or extreme left hand columns and those for the fund with the lowest rate, the last, or extreme right hand column. The method used in determining which total rate was the highest consisted essentially in the application of the rates to a staff used as standard in respect to age and service distributions, as is subsequently explained at greater length.

Aggregate rates are shown in the tables for all funds for which they were developed. In those cases where select and ultimate rates were used instead of an aggregate rate, the ultimate rate and the select rate for the first year are both given. The aggregate rate in such cases would of course lie between the two.

In comparing the rates presented in these tables one must always bear in mind that in a given fund each rate is not absolutely independent of every other rate, but to a certain extent the rates may be mutually dependent. Total rates of withdrawal, total rates of death, and certain of the rates of retirement are probably in general sufficiently independent of other rates to indicate directly fundamental differences between the funds and to be fairly comparable. Rates representing divisions of the withdrawal rate, divisions of the mortality rate in active service, or divisions of the disability retirement rate are not so directly comparable. A low rate of dismissal, for example, may be accompanied by a high rate of resignations.

nation, because the practice in the department may be to suggest a resignation in cases where a dismissal is likely to follow if the suggestion of resignation is not adopted. Similarly high rates of death and of disability from causes arising in the active service may be acduty were high might, under some circumstances, indicate not so much the great dangers of the occupation as the laxity of the administrators in deciding what injuries, diseases and deaths were actually attributable to the risks of the service. Such rates must therefore be concompanied by very low rates of death and of disability from other causes. The fact that the rates from causes arising in the course of sidered in connection with their complementary rates in making comparisons.

TABLE 197—COMPARATIVE RATES OF WITHDRAWAL FROM ACTIVE SERVICE

	HEALTH	1,18	CLERES	EES	LABORERS	SEE		MECHANICS	ANTICS	DEPARTMENT OF	TENT OF					
AGE	PENSION FUND MEN		CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND	CITY OF NEW YORK CH EMPLOYEES' RETIREMENT FUND RE	CITY OF N. EMPLOY	EMPLOYERS' TIREMENT FUND	College of the City of New York	CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND	TOP NEW YORK EMPLOYEES'	STREET CLEANING RELIEF AND PENSION FUND	LEANING 7 AND 1 FUND	Teachers' Retirement Fund	Teachers' Retirement Fund	Police Pension	Supreme Court Retirement Funds	Fire Department Relief
	1st Year	Ulti- mate	1st Year	Ulti- mate	1st Year	Ulti- mate	Retirement Fund	Year	Ulti- mate	rest	Ulti-	Women	Men	Fund	Combined	Fund
15	.0411	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
91	.0446	:	.0887	:	.1586	:	:	.0945	:	:	:	:	:	:	:	:
17	-0494	:	.1022	:	.1643	:	:	6901.	:	:	:	:	:	:	:	:
8	.0551	.0238	.1157	:	1691	:	:	.1156	:	:	:	.0025	.0012	:	:	:
61	.0631	.0259	.1271	1990.	.1734	.0555	:	.1227	0404	:	:	.0054	.0047	:	:	:
2	.0777	.0313	. 1379	.0673	1768	.0571	.1240	.1280	.0448	.1092	:	.0102	0110.	.0563	.0402	.0370
21	. 1027	.0413	.1467	.0677	96/1.	.0582	.1220	.1320	.0514	.1327	:	.0175	9220.	0410	.0366	.0362
75	.1307	.0437	.1545	9290.	.1822	.0590	6811.	.1357	.0634	.1560	:	.0258	1/20.	.0400	.0331	.0346
23	.1585	.0450	6091	6990	.1840	.0593	.1140	.1390	0690	. 1647	.0589	.0455	.0284	.0338	.0302	.0330
24	.1883	.0458	8991.	.0662	. 1850	1650.	0801.	.1418	.0703	. 1642	.0493	.0581	.0200	1620.	.0273	.0304
25	.2144	.0465	1721	.0655	.1857	.0586	. IO24	.1442	.0702	.1558	.0445	.0613	1620.	.0257	.0248	.0203
9	.2357	.0471	.1765	.0647	.1862	9250.	.0975	.1465	.0685	.1434	0400	.0621	.0285	.0234	.0227	.0172
27	.2481	.0476	6621.	.0639	.1860	.0563	.0937	.1478	.0649	.1290	.0378	9090	.0275	.0218	.0207	.ox46
78	.2577	.0480	.1828	.0630	.1852	.0548	8060	.1484	.0589	.1158	.0354	.0579	.0262	.0203	.0188	.0127
6	. 2642	.0484	.1853	.0620	.1838	.0528	8880.	.1488	.0522	1064	.0333	.0541	.0237	0810.	.0172	4110.
30	. 2699	.0485	.1868	0190.	6181.	.0506	9280.	.1472	.0457	9001.	.0316	.0498	9120.	8910.	.0157	.0103
31	.2731	.0487	.1875	.0599	180I	.0486	.0863	.1451	.0417	2960.	.0300	.0445	.0195	.0147	.0142	.0003
32	.2763	9840	.1870	.0587	8241	.0464	.0842	.1430	1050.	.0932	.0285	.0384	.or75	0210.	.0130	.0085
33	.2771	.0489	.1872	.0575	.1752	.0443	8180.	.1400	.0371	7000.	.0272	.0322	.o154	.0107	.0120	.0077
34	.2778	.0488	. 1859	.0560	1729	.0424	.0780	.1390	.0356	.0887	.0259	.0263	.0141	.0003	6010.	.0070
35	.2772	.0487	.1836	.0543	.1703	.0400	.0723	.1370	.0344	.0877	.0240	.0218	.0126	.0083	00100	.0063
36	.2760	.0486	0181.	.0528	1671	.0395	.0628	.1363	.0333	.0850	.0234	.0182	010	8/00.	1600	.0054
37	.2739	.0483	.1773	.0510	.1637	.0383	.0528	.1352	.0324	.0839	.0223	.0152	8600.	.0075	.0083	.0033
88	. 2692	.0479	.1733	.0489	1602	.0372	.0435	. I340	.0316	.0827	.0213	7210.	.0087	.0073	.0075	0000
9	.2652	.0475	.1654	.0465	1867	.0361	.0358	.1315	.0300	.0817	.0204	9010.	9800.	1/00.	8900.	9200.
2	.2591	.0468	.1625	.0445	.1531	.0352	.0294	.1293	.0303	.0805	9010.	0890	.0073	9900.	1900.	.0024
41	:	.0459		.0411	-	.0343	.0248		.0207	-	.0180	.0072	8900.	.0063	. 0054	.0022

TABLE 197—COMPARATIVE RATES OF WITHDRAWAL FROM ACTIVE SERVICE—Continued

Principal College Prin	_	HEALTH	F .	CLERKS	21.	LABOI	BOREES		MECH	MECHANICS	Destan	20 17.25					
11		DEPARTM PENSIO FUND MEN		CITY OF N EMPLC RETIREMS			YORK ES'	College of the City of New York Retirement	CITY OF N EMPL(RETIREM)		STREET C RELIE PENSION	LEANING F AND FUND	Teachers' Retirement Fund	Teachers' Retirement Fund	Police Pension Fund	Supreme Court Retirement Funds	Fire Departmen Relief
0440 0334 0314 0113 0189 0184 0016 0003 00003 0003 0003 <t< th=""><th><u> </u></th><th></th><th>Ulti- mate</th><th>1st Year</th><th>Ulti- mate</th><th>ıst Year</th><th></th><th>Fund</th><th>rst Year</th><th>Ulti- mate</th><th>ıst Year</th><th>Ulti- mate</th><th>Women</th><th>Men</th><th></th><th>Combined</th><th>Fund</th></t<>	<u> </u>		Ulti- mate	1st Year	Ulti- mate	ıst Year		Fund	rst Year	Ulti- mate	ıst Year	Ulti- mate	Women	Men		Combined	Fund
0437 0437 <th< td=""><td> </td><td> -</td><td>0440</td><td>:</td><td>.0383</td><td>:</td><td>.0334</td><td>.0213</td><td>:</td><td>.0289</td><td>:</td><td>.0182</td><td>.0058</td><td>.0003</td><td>.0057</td><td>.0048</td><td>.0020</td></th<>		 -	0440	:	.0383	:	.0334	.0213	:	.0289	:	.0182	.0058	.0003	.0057	.0048	.0020
0440 0440 <th< td=""><td>_</td><td>_</td><td>.0437</td><td>:</td><td>.0354</td><td>:</td><td>.0324</td><td>.0184</td><td>:</td><td>.0282</td><td>:</td><td>9/10.</td><td>9400</td><td>.0058</td><td>.0050</td><td>.0043</td><td>6100.</td></th<>	_	_	.0437	:	.0354	:	.0324	.0184	:	.0282	:	9/10.	9400	.0058	.0050	.0043	6100.
0309 0304 0307 0314 0304 0309 0309 0304 0309 0304 <td< td=""><td>_</td><td>_</td><td>.0420</td><td>:</td><td>.0329</td><td>:</td><td>9160.</td><td>7910</td><td>:</td><td>.0274</td><td>:</td><td>0710.</td><td>.0034</td><td>.0053</td><td>.0043</td><td>.0038</td><td>8100.</td></td<>	_	_	.0420	:	.0329	:	9160.	7910	:	.0274	:	0710.	.0034	.0053	.0043	.0038	8100.
03/56 0.0364 0.0349 0.0135 0.0351 0.0020 0.0046 0.0021 0.0030 0.0031 </td <td></td> <td></td> <td>.0399</td> <td>:</td> <td>.0306</td> <td>:</td> <td>.0307</td> <td>.0147</td> <td>:</td> <td>.0264</td> <td>:</td> <td>9910.</td> <td>.0027</td> <td>.0050</td> <td>.0036</td> <td>.0034</td> <td>7100.</td>			.0399	:	.0306	:	.0307	.0147	:	.0264	:	9910.	.0027	.0050	.0036	.0034	7100.
0.917 0.0564 0.0269 0.012 0.0372 0.0156 0.0269 0.0272 0.0173 0.0174 0.0018 0.0014 0.0019 0.0014 0.0017 <td></td> <td>_</td> <td>.0366</td> <td>:</td> <td>.0284</td> <td>:</td> <td>8620.</td> <td>.0135</td> <td>:</td> <td>.0251</td> <td>:</td> <td>910.</td> <td>.0022</td> <td>9*00.</td> <td>.0030</td> <td>.0030</td> <td>9100.</td>		_	.0366	:	.0284	:	8620.	.0135	:	.0251	:	910.	.0022	9 * 00.	.0030	.0030	9100.
0.0551 0.044 0.0779 0.0111 0.0322 0.0154 0.0013 0.0013 0.0013 0.0013 0.0013 0.0013 0.0013 0.0013 0.0013 0.0013 0.0014 </td <td>_</td> <td></td> <td>.0317</td> <td>:</td> <td>.0264</td> <td>:</td> <td>.0289</td> <td>.0122</td> <td>:</td> <td>.0232</td> <td>:</td> <td>.0156</td> <td>8100.</td> <td>.0041</td> <td>.0025</td> <td>.0027</td> <td>.0015</td>	_		.0317	:	.0264	:	.0289	.0122	:	.0232	:	.0156	8100.	.0041	.0025	.0027	.0015
0.012 0.0226 0.1050 0.0175 0.0148 0.0019 </td <td>_</td> <td>_</td> <td>.0251</td> <td>:</td> <td>.0244</td> <td>:</td> <td>.0279</td> <td>.0112</td> <td>:</td> <td>.0202</td> <td>:</td> <td>.0152</td> <td>.0015</td> <td>0037</td> <td>.0022</td> <td>.0023</td> <td>4100.</td>	_	_	.0251	:	.0244	:	.0279	.0112	:	.0202	:	.0152	.0015	0037	.0022	.0023	4 100.
0.156 0.329 0.0100 0.130 0.0143 0.0013 0.0018 <td>_</td> <td><u> </u></td> <td>.0212</td> <td>:</td> <td>.0220</td> <td>:</td> <td>.0270</td> <td>9010.</td> <td>:</td> <td>.0175</td> <td>:</td> <td>.0148</td> <td>4100.</td> <td>.0033</td> <td>6100.</td> <td>.0021</td> <td>.0013</td>	_	<u> </u>	.0212	:	.0220	:	.0270	9010.	:	.0175	:	.0148	4 100.	.0033	6100.	.0021	.0013
10156	_		.o.180	:	.0200	:	.0259	0100	:	.0130	:	.0143	.0013	6200	8100.	8100.	.0012
1015 10174 10336 10083 10136 10011 10023 10016 10017 10027 10126 10017 10027 10126 10017 10007	_		.0156	:	1610.	:	.0248	.0004	:	8200.	:	.0140	.0012	9200.	7100.	9100.	0I00.
0116 0157 0223 0085 0037 0113 0010 0010 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 0011 0001 <td< td=""><td></td><td>_</td><td>.0135</td><td>:</td><td>.0174</td><td>:</td><td>.0236</td><td>888 9</td><td>:</td><td>.0053</td><td>:</td><td>.0136</td><td>1100.</td><td>.0023</td><td>9100</td><td>4100.</td><td>8 8</td></td<>		_	.0135	:	.0174	:	.0236	888 9	:	.0053	:	.0136	1100.	.0023	9100	4100.	8 8
.0000 .0143 .0210 .0034 .0013 .0010 .0015 .0010 .0011 .0010 .0011 .0010 .0011 .0010 .0011 .0011 .0011 .0011 .0011 .0011 .0011 .0011 .0001 .0011 .0001 .0011 .0001 .0011 .0001 .0011 .0001 .0011 .0001 <td< td=""><td>_</td><td></td><td>9110.</td><td>:</td><td>.0157</td><td>:</td><td>.0223</td><td>.0085</td><td>:</td><td>.0037</td><td>:</td><td>.0132</td><td>0 1 0</td><td>.0020</td><td>9100.</td><td>.0012</td><td>.0007</td></td<>	_		9110.	:	.0157	:	.0223	.0085	:	.0037	:	.0132	0 1 0	.0020	9100.	.0012	.0007
0.07/9 .0139 .0197 .0018 .0133 .0004 .0014 .0004 0.065 .0116 .0170 .0077 .0003 .0114 .0004 .0013 .0114 .0004 .0011 .0004 .0011 .0004 .0011 .0004 .0011 .0004 .0011 .0004 .0011 .0004 .0011 .0004 .0011 .0004 .0011 .0004 .0	_	_	9600.	:	.0143	:	.0210	.0082	:	.0025	:	.0128	0100.	7100.	.0015	0100	900.
.0065 .0116 .0183 .0075 .0013 .0019 .0003 .0011 .0003 .0011 .0003 .0011 .0003 .0011 .0004 .0011 .0004 .0011 .0004 <td< td=""><td>_</td><td>_</td><td>.0070</td><td>:</td><td>.0129</td><td>:</td><td>7610.</td><td>.0077</td><td>:</td><td>8100.</td><td>:</td><td>.0123</td><td>6000</td><td>.0014</td><td>4100.</td><td>6000</td><td>.000</td></td<>	_	_	.0070	:	.0129	:	7610.	.0077	:	8100.	:	.0123	6000	.0014	4 100.	6000	.000
10051			.0065	:	9110.	:	.0183	.0075	:	.0013	:	6110.	8000	.0012	.0013	.000	.000
.0037 .0038 .0006 .0007 .0009 .0008 .0004 .0023 .0024 .0005 .0005 .0005 .0006 .0003 .0004 .0003 .0023 .0024 .0005 .0005 .0006 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 .0003 .0004 </td <td>_</td> <td>_</td> <td>.00SI</td> <td>:</td> <td>.o104</td> <td>:</td> <td>.0170</td> <td>1,000</td> <td>:</td> <td>6000.</td> <td>:</td> <td>, oi 14</td> <td>.000</td> <td>0100</td> <td>1100.</td> <td>9000.</td> <td>00.</td>	_	_	.00SI	:	.o104	:	.0170	1,000	:	6 000.	:	, oi 14	.000	0100	1100.	9000.	00.
		_	.0037	:	.0003	:	.0158	8900	:	.000	:	8010.	7000.	8000.	8000.	.000	.000
.0010 .0072 .0043 .0004 .0004 .0004 .0004 .0004 .0002 .0004 .0002 .0004 .0002 .0004 .0002 .0004 .0002 .0001 .0002 .0002 .0002 .0001 .0002 <td< td=""><td>_</td><td>_</td><td>.0023</td><td>:</td><td>1800.</td><td>:</td><td>.0145</td><td>2005</td><td>:</td><td>800.</td><td>:</td><td>.0102</td><td>9000.</td><td>000.</td><td>9000.</td><td>.003</td><td></td></td<>	_	_	.0023	:	1800.	:	.0145	2005	:	800.	:	.0102	9000.	000.	9000.	.003	
10000	_	:	0100.	:	.0072	:	.0133	.0063	:	400	:	9600.	80 50	.0003	• •	.000	:
10008		:	000	:	.0050	:	6110.	.0057	:	.003	:	8 8 9	4 000.	8	.000	.000	:
10003	_	:	800	:	.0052	:	.0105	.0054	:	.000	:	.0082	.003	:	:	:	:
		:	800	:	.0043	:	6800.	.0050	:	1000.	:	.007 4	.0002	:	:	:	:
	_	:	9	:	.0035	:	.0074	.0047	:	1000	:	•	1000	:	:	:	:
	_	:	8	:	.0027	:	1000	.0044	:	:	:	.0055		:	:	:	:
	_	:	9 00	:	6 <u>10</u> 0.	:	.0047	0039	:	:	:	.0044	:	:	:	:	:
	_	:	900	:	.0012	:	.0030	.0030	:	:	:	.0034	:	:	:	:	:
	~	:	000	:	900 •	:	.0020	.0033	:	:	:	.0013	:	:	:	:	:
	_	:	:	:	.000	:	7100.	.0027	:	:	:		:	:	:	:	:
		:	:	:	:	:	6000 0000	.0024	:	:	:	:	:	:	:	:	:
	_	:	:	:	:	:	4000	6100 -	:	:	:	:	:	:	•	:	:
	~	:	:	:	:	:	.003	0100	:	:	:	:	:	:	:	:	:
		:	:	:	:	:	8	.0013	:	:	:	:	:	:	:	:	:
:: - :: - :: - :: - :: - :: - :: - ::	-	:	:	:	:	:	:	.000	:	:	:	:	:	:	:	:	:
	_	:	:	:	:	:	:	.003	:	:	:	:	:	:	:	:	:

TABLE 198—COMPARATIVE RATES OF RESIGNATION FROM ACTIVE SERVICE

Aca	HEA DEPAR PEN FU	TMENT	CLE CITY NEW EMPLO RETIR	YORK YORK YEES'	Barre	YORK YORK YEES' EMENT	CITY NEW EMPLO RETIR FU	YORK YORK YEES'	OF S CLE RELU PEN	RTMENT TREET ANING OF AND ISSON UND	POLICE PENSION FUND	Pire Depart nort Relief Fund
	ret Year	Ulti- mate	ıst Year	Ulti- mate	ıst Year	Ulti- mate	ıst Year	Ulti- mate	ıst Year	Ulti- mate	Aggre- gate	Aggre- gate
15	.0232			• • • •)
16	.0272	• • •	.0749		.0790	• • •	. 1040					
17	.0328	•••	. 0880	• • •	.0913		. I 100	• • •			• • •	
18	.0395	.0066	. 1010	• • •	. 0999		. 1150	• • •	• • •		• • • •	l
19	.0488	.0100	. 1120	.0597	. 1068	.0286	. 1 194	.0379			• • •	:::
20	1	.0170	. 1 2 20		. 1120	- 000	. 1 2 30	0 ,	.0470	1 · · · · I	.0450	.0200
21	, ,	.0284		.0610			_	.0408		···	.0360	.0289
22		.0320	. 1370		- 1	.0520			.0455		.0281	.0273
23		.0344	. 1425	.0600			. 1309				.0217	.0237
24	. 1810		. 1473	.0591	•	.0599		.0419		11	.0168	.0130
25	. 2080		. 1515	.0583	٠.	_	. 1330		.0430		.0134	.0130
26	. 2300			.0574		.0585		.0406	.0422		.0111	.0076
27	. 2430		. 1571	.0565			. 1339	.0394	.0414	.0142	.0006	.0058
28	. 2530		3.	.0555	_		· 1333		.0405	.0127	.0083	.0045
29		.0420	. 1605	0544			. 1323		.0398		.0069	.0036
30	. 2660	.0426	. 1610	.0532			. 1308		.0391	- 1	.0057	.0028
31	. 2695	.0432	. 1609	.0520			. 1292		.0383	.0097	.0036	.0022
32	. 2730	.0437	. 1602	.0507			. 1274		.0375	.0000	.0030	.0017
33	. 2740	.0442	. 1590	.0494					.0370	.0085	.0028	.0014
34 35	. 2750	.0444	. 1570	.0478	. 1021		. 1230		.0364	.0081	.0010	.0011
36	.2745	.0440	.1541	.0460			. 1 208		.0358	.0076	.0019	.0000
	.2735	.0447	.1511	.0444	.0013		.1180		.0352	.0073	.0014	.0007
37 38	. 2715	.0447	. 1472	.0425	.0862	•	.1150		.0346	.0069	.0013	.0006
30 39	. 2670	,,,,	.1430	.0404	.0812	-	.1120	•	.0341	.0066	.0013	.0004
40	. 2630	1 12	. 1350	.0380	.0762		.1000		.0338	.0063	1100.	.0003
41	. 2570	.0438	.1322	.0360	.0722	.0217	. 1000	.0208	.0331	.0061	.0000	.0002
42	1	.0431	• • • •	.0327	• • • •	.0212	• • • •	.0201	• • • • •	.0058	.0008	1000.
43	• • •	.0423	• • • •	.0300	• • • •	.0205	• • • •	.0195		.0055	.0006	.000I
44		.0412	•••	.0272	•••	.0198	• • • •	.0189	• • • •	.0053	.0005	1000.
45		.0397	•••	.0249	• • •	.0192 .0183	• • • •	.0184	• • • •	.0050	.0004	
46		.0377	••••	.0200	• • • •	•	• • • •	.0179			.0003	•••
47		.0345	• • • •	.0193	• • •	.0172	• • •	.0174	• • • •	.0045	.0003	•••
48		.0233		.0193	• • • •	.0157	• • • • •	.0169 .0164	• • •	.0040	.0003	•••
49	1 ::: 1	.0105		.0163	• • • •	.0131	•••	.0160	• • • •	.0038	,0003	• • •
50	1 ::: 1	.0164		.0150		.0077	• • • •	.0155	• • • •	.0035	.0002	•••
51	1 1	.0141		.0136		.0046	• • • •	.0150		.0033	1000	•••
52	:::	.0120	:::	.0134		.0032	• • • •	.0144		.0030	1000.	•••
53	:::	.0102	:::	.0112		.0032	• • • •	.0138	:::	.0028	.0001	•••
54	:::	.0083		.0102		.0016		.0132		.0026	1000.	• • •

TABLE 198—COMPARATIVE RATES OF RESIGNATION FROM ACTIVE SERVICE—Continued

/GB	DEPAI PEN	LTH TMENT SION IND	CIT NEW EMPLO RETIR	Y OF YORK YORK OYKES' EMENT IND	CIT NEW EMPLO RETIR	ANICS Y OF YORK OYERS' EMENT JND	CIT NEW EMPLO RETIR	Y OF YORK OYERS' EMENT	OF S: CLE/ RELIE PEN	RTMENT TREET ANING IF AND BION UND	Police Pension Fund	FIRE DEPART MENT RELIES FUND
	ist Year	Ulti- mate	ıst Year	Ulti- mate	ıst Year	Ulti- mate	ist Year	Ulti- mate	ıst Year	Ulti- mate	Aggre- gate	Aggre- gate
55	·	.0067		.0002		.0012		.0125		.0023	.0001	
56		.0053		.0083		.0008		.0118		.0021	.0001	
57		.0040		.0075		.0006		.0111		.0019	• • •	• • • •
58		.0027	• • •	.0067		.0004		.0105		.0016	• • •	• • • •
59		.0013		.0059		.0003		.0098	• • •	.0014	• • •	• • • •
60		.0001		.0052		.0003	• • •	.0091		.0012	• • •	• • • •
61		• • • •	• • • •	.0042		.0002		.0082	• • • •	.0010	• • •	• • •
62			•••	.0038	• • •	1000.	• • •	.0073		.0008	• • •	• • • •
63	• • • •	• • •	•••	.0031	• • •	.0001	• • • •	.0062	•••	.0006	• • •	• • • •
64		• • • •	• • • •	.0025	• • •	.0001	• • • •	.0051	• • • •	.0004	• • •	• • •
65	• • •	• • • •	• • • •	.0019		1 1	• • •	.0041	• • • •	.0002	• • •	• • •
66		• • •	• • • •	.0013			• • •	.0031	• • •	• • • •	• • •	• • •
67		• • • •	• • •	.0008		•••	• • •	.0023	•••	• • • •	• • •	• • •
68		• • •	• • • •	.0003	• • •	•••	• • •	.0015	• • • •		• • •	• • •
69		• • • •	• • • •		• • •	•••	• • •	.0000	• • •		• • •	• • •
70	• • • •	• • • •	• • •		• • •	•••	• • •	.0003	• • •	• • • • •	• • •	• • •
71	•••	• • • •	• • • •		• • •	•••	• • • •		• • •		• • •	• • •
72	• • •	• • • •	• • • •			•••	• • • •	• • • •	• • • •		• • •	• • •
73			• • • •	• • • •		•••	• • •		• • •	• • • •	• • •	• • •
74			•••		• • •	• • •	•••				•••	• • •
75		• • • •]	• • •		• • •		• • • •	• • • •	• • • •	• • • •	• • •	• • •
76		• • • •	• • • •		• • •	• • •	• • • •	• • • •	• • • •	• • • •	• • • •	• • •
77		• • • •	• • • •	• • • •	• • •	• • • [• • • •		• • • •		• • •	• • •
78		• • • •	• • • •		• • •			• • • • •			•••	• • •
79			• • • •	• • • •	• • •		• • •	• • • •	• • • •		• • • •	• • •
80		• • • •	• • • •	• • • •	• • •	• • •	• • •	• • • •]	• • • •	• • • •	• • • •	• • •
81		• • • •	• • •	• • • •	• • •		• • •	· · · ·	• • • •	• • • •	• • •	• • •
82	• • •	• • • •	• • • •	• • • •	• • •	• • • •	• • • •	• • • • •	• • • •	• • • •	• • • •	• • •
83	• • • •	• • • •	• • • •	• • • •	• • •	• • • •	• • • •	• • • •	• • • •	• • • •	•••	• • •
84	• • • •	• • • • }	•••	•••	• • •	• • • •	• • • •	• • • •	• • • •	• • • •	• • • •	• • •
85		· • • •	•••	••••	• • •	• • • • •	• • • •	• • • •	• • • •	• • • •	• • •	• • •
86	• • • •	· • ∤	• • •	• • • •	•••		• • •	• • • • •	• • • •	• • •	• • • •	• • •
87	• • • •	· • • •		•••	• • •	· · · ·	• • • •		• • • •	• • • •	•••	• • •
#	• • • •	· • • • ∤			•••	• • • •		• • • •		• • • •	•••	• • •
89		• • • • •	• • • •		• • •				• • • •	• • • •		• • •

TABLE 199—COMPARATIVE RATES OF DISMISSAL FROM ACTIVE SERVICE

TABLE 199—COMPARATIVE RATES OF DISMISSAL FROM ACTIVE SERVICE—Continued

AGE	OF ST CLEA RELIE PEN	NING F AND	CITY NEW EMPLO RETIR FU	F OF YORK OYEES' EMENT	CIT'S NEW EMPLO	Y OF Y OF Y ORE OYES' EMENT	EMPL	Y OF YORK OYEES'	Police Pension Fund	PEN Fu	TMENT SION	FIRE DEPART- MENT RELIEF FUND
	ret Year	Ulti- mate	ıst Year	Ulti- mate	ıst Year	Ulti- mate	rst Year	Ulti- mate	Aggre- gate	ıst Year	Ulti- mate	Aggre- gate
55		.0100		.0072		.0006		.0037	.0013		.0012	.0003
56		.0098	• • •	.0065		.0005	• • •	.0033	.0012		.0012	.0002
57		.0095	• • • •	.0059		.0003	• • •	.0029	1100.		.0011	.0001
58	• • •	.0002	• • • •	.0053		.0003	• • •	.0026	.0008	• • • •	.0010	.0001
59	• • • •	.0088	• • •	.0047	• • • •	.0002	• • •	.0022	.0006	• • •	.0010	.0001
60 61	• • • •	.0084	• • • •	.0042		1000.	• • •	.0020	.0004	• • • •	.0009	• • •
62	• • • •	.0080	• • •	.0037		.0001	• • •	.0017	.0002		.0000	• • •
63	:::	.0074		.0032	:::			.0012			.0008	• • •
64		.0060		.0023	l :::	:::		.0010	• • •	:::	.0007	• • •
65	l :::	.0053		.0020	:::			.0008	• • • •		.0006	
66	1	.0044		.0016				.0006	• • •		.0004	
67		.0034		.0013				.0004	• • •		.0002	
68		.0023		.0011				.0003			1000.	• • •
69	1	.0011		.0008				.0002				• • •
70				.0006					• • •	• • •		• • •
71	1	• • • •		.0004			• • •		• • •	• • •	• • • •	• • •
72				.0003	• • • •	• • •	• • • •	•••	• • • •			• • •
73	• • •	• • • •		10001	• • •		• • •	• • • •		• • • •	• • • •	• • •
74	1				• • • •		• • • •	• • • •	•••	• • • •	• • •	• • •
75 76			• • • •	• • • •	• • • •		• • • •	• • • •	• • •			• • •
70		1	l					.	• • • •		• • •	• • •
77 78	:::	:::	:::	l	:::		:::		• • •	l	:::	• • • • • • • • • • • • • • • • • • • •
79	:::	:::	1 :::	l :::	:::	:::	:::	:::		:::	:::	
80	1 :::	:::	l :::	:::	:::	:::	:::			:::		
81	1 :::	1 :::	1									:::
82									•••			
83												
84												
85							• • • •				}	
86								• • •				• • • • •
87	1						• • •					
88	• • • •				• • •				• • • •		• • •	
89	• • • •			• • • •	• • •							···•
90		1				• • • •		• • •			• • •	• • • •

TABLE 200—COMPARATIVE RATES OF DEATH IN ACTIVE SERVICE
All Funds

	LABORERS	RERS	CLERKS	RKS	MECHANICS		DEPARTMENT OF	ENT OF	200	HEALTH		Fire	Supreme	Teachers'	Teachers	College of
AGB	CITY OF N EMPLO RETIREM	CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND	CITY OF NEW YORK EMPLOYEES' RETREMENT FUND	EW YORK PEES' INT FUND	CITY OF NEW YO EMPLOYEES!	M G	STREET CLEANING RELIEF AND PENSION FUND	FUND	Pension Fund	PENSION FUND MEN		Department Relief Fund	Retirement Funds Combined	Retirement Fund Women	Retirement Fund Men	New York Retirement Fund
	ıst Year	Uld- mate	1st Year	Ulti- mate	1st Year	Ulti- mate	ret Year	Ulti- mate	Aggrogate	Year	URd- mate	Aggregate	Aggregate	Aggregate	Aggregate	Aggregate
15		:	:	:	:	:	:	:	:	8100.	:	:	:		:	
9	.004	: :	.0042	: :	8200	:	: :	: :		8100	: :	: :	:	::	:	: :
17	.0045	:	.0044		7200.	:	:	:	:	8100	:	:	:	:	:	:
18	.0046	:	.0045	:	.0028	:	:	:	:	6100	1200	:	:	1100.	0000	:
19	.0047	9500.	.0046	.0052	.0028	.0033	:	:	:	.0020	.0022	:	:	.0012	1100	:
20	.0047	.0057	7400	.0054	.0020	.0034	.0038	:	9200	.0020	.0023	.0034	.0031	.0013	.0013	6100.
21	.0049	.0059	.0048	9800.	.0030	.0035	.0040	:	9200	.0022	.824	.0035	.0033	,0014	4100.	.0030
77	.0050	1900.	849	.0058	.0031	.0030	.0041	:	.0038	.0022	0000	.0030	.0034	9000	.0017	.0020
23	.0051	.000	80.	80.	.8032	.0037	.0043	.0053	.0028	.003	.0027	.8037	.0030	8100	8100.	.0021
*	.0053	.0005	8.	.00	.0033	.0039	040	8	.0020	.0022	.0020	.0038	.0037	.0020	.0020	.0021
25	.0055	8000	853	80,	.834	933	.0050	.000	.0031	.002	.0030	040	.0030	.0023	.0032	.0022
2 20	.865	.007	8.5	8000	.034	200	. 9055	7000	.0032	2200.	.8632	100	00400	.0025	.0024	.0023
7 0	1000.	.0075	.0057	1,000	.0035	2 900	1000	720	450	4700	450	5	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	0200	0200	.0023
9 0	4 %	5,2	95.6	4/8/	200	3 6	8 6	2 8	8	3,6	3 6	3 8	4 2	55.5	550	.0024
30	2,0	3 0	3 6	3	3 6	000	8	800	400	200	200	900	0047	25.00		3,5
31	. 67	,000	867	800	440	8.4	8,00	880	0400	.0020	904	9700	.0040	4500	4500	.0026
32	.0085	oros.	0,000	.0087	.0047	8500.	.0082	1600	.0053	.0031	.0047	.0047	0500.	.0035	1900.	.0027
33	.0002	4110·	.0073	1600.	.0051	.0063	.0084	4600	.0058	.0032	.0050	6400.	.0052	.0036	.0063	.0028
34	8600.	.0122	92.	.0005	.0055	.000	9800	9600	.0063	.0034	.0053	6900.	.0054	.0036	1900.	.0029
32	.0105	.0130	80.	8600	900.	.0073	0800	6600 •	.0007	.037	.0050	.0050	.0056	.0036	ó\$00·	.0030
8 8 1	.0112	.o138	883	.0102	0000	0200	8	ioio.	.0072	.0038	.0050	.0051	.0058	.0037	.0050	.0032
700	6110.	.or40	. 887	0100	.007	000	8,6	010.	.0077	200		200.	986	.0039	.0053	.0033
9 6	7710	2010	3 6	7110	3,8	1010	8	800	200	2 2	3 8	3000	7000		1700	45.00
\$.0142	1/10.	.0103	.0123	00	9010	0010	1110.	9800.	1500	.0075	9000	.0067	.0044	.0033	.0037
41	:	0210.	:	.ot30	:	.0115	:	.0113	8800.	· :	980	.0057	6900.	9000	.0032	.0039
42	:	.0187	:	.0138	:	.0123	:	SIIO.	8 8 9	:	.0085	.0059	1700.	.0048	8200.	.0040
4 3	:	9610.	:	.or46	:	.0132	:	9110.	.0093	:	0000	1900	.0074	.0050	.0028	.0042
4	:	.0204	:	.0155	:	.0139	:	0118	2600.	:	9600	.0063	7,000	.0053	.0027	.0044
45	:	.0212	:	9910.	:	.or48	:	6110.	2600.	:	.0103	9900.	6200.	.0056	9200.	.0046
\$:	:	.0221	:	8/10.	:	.0157	:	.0120	ioio.	:	0 0 0 0	.0073	.0083	.0059	.0038	.0049
47	:	.0229	:	.0192	:	8910.	:	.0121	.0107	:	9110.	.0084	2800.	.0062	.0033	.0052
4 6	:	.0239	:	.0208	:	0180	:	.0123	7110.	:	.0122	.0102	8800.	9000	.0035	.0055
5 .	:	.0248	:	.0228	:	.0192	:	.0124	.0133	:	.0131	1210.	.0002	.0070	.0038	. 0058
<u></u>	:	.0257	:	.0255	:	.0200	:	.0125	.0152	:	.0139	0130	5000	.0075	.0045	1900.
27	:	.0200	:	1220	:		:	0120	2,172	-	.0147	.0147	6600.	0800	.0040	9900
40		5/20		1					2		2000	20.2	2040.	2000	3	.0070

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TABLE 200-COMPARATIVE RATES OF DEATH IN ACTIVE SERVICE—COMMISSION
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¥9	CITY OF NEW Y EMPLOYEES RETIREMENT F	W 0	CITY OF NEW YORK EMPLOYEES' RETIREMENT FUND	EW YORK (MECHANICS CITY OF NEW YOR EMPLOYERS	M 40	DEPARTMENT OF STREET CLEANING RELIEF AND PENNION FUND	LEANING FAND FEUND	Police Pension Fund	HEALTH DEPARTMEN PENSION FUND MEN	HEALTH DEPARTMENT PENSION FUND MEN	Fire Department Relief Fund	Supreme Court Retirement Funds Combined	Teachers' Retirement Fund Women	Teachers' Retirement Fund Men	College of the City of New York Retirement Fund	
	rear	Ulti- mate	1st Year	Ulti- mate	Year	Ulti-	18t Year	Ulti- mate	Aggregate	Year	Ulti- mate	Aggregate	Aggregate	Aggregate	Aggregate	Aggregate	
53		.0284	:	9880		.0251	:	.0120	.0203	:	1910.	1910.	.0107	1000.	7300.	2,007.	
8	:	.0203	:	.0203	: :	.0266	:	.0130	.0213	:	.0173	9910.	.0112	.0007	.0062	1800.	
55	:	.0302	:	.0207	:	.0278	:	.0132	.0220	:	.0182	1/10.	9110.	,010.	.0070	8800.	
20	:	.0300	:	.0301	:	.0287	:	.or34	.0224	:	.0192	9210.	.0122	.0112	.080	7600.	
22	:	.0317	:	.0305	:	.0295	:	.0135	.0225	:	.0201	0810.	.0127	.0120	.0088	9010.	
88	:	.0325	:	.0308	:	.0302	:	.0137	.0229	:	.0208	,o184	.0133	.0129	9600.	6110.	
8	:	.0332	:	.0313	:	.0308	:	.0139	.0235	:	.0213	.0188	ó£10.	.0139	, OIO4	.0135	
8;	:	.0340	:	.0318	:	.0315	:	.0142	.0247	:	.0218	.0102	.0140	.0150	.0113	oiss.	
5	:	.0347	:	.0322	:	.0321	:	.0145	.0205	:	.0222	7610.	.0153	.0102	.0134	1810.	
7 5	:	.0354	:	.0327	:	.0327	:	.0140	0520	:	.0225	1020.	2010.	.0175	.0155	.0212	
3 3	:	.0301	:	.0331	:	.0332	:	.0152	.0320	:	.0220	0020	1210.	6010.	00100	.0242	
\$ 2	:	.0300	:	.0335	:	.0341	:	.0150	.0355	:	.0232	4120.	1010.	40204	.0200	.0272	
8	:	.0374	:	.0339	:	.0350	:	1010.	.0393	:	.0234	9120.	2010.	.0221	.0234	.0303	
8 5	:	.0302	:	.0344	:	.0301	:	2010.	.0432	:	.0230	ozzo.	.0205	.0240	.0257	.0330	
6	:	.0392	:	.0348	:	.0373	:	.0173	.0472	:	.0241	.0239	.0220	.0200	.0285	.0372	
8	:	.0401	:	.0353	:	.0399	:	0010	.0512	:	.0245	.0254	.0239	.0202	.0316	.0412	_
3 6	:	.0414	:	.0357	:	.0407	:	0010.	.0553	:	.0250	.0274	0200	.0300	.0338	.0450	
?;	:	.0420	:	.0301	:	.0420	:	2610.	.0590	:	.0250	.0295	.0205	.0332	.0300	.0502	
7 £	:	.0440	:	.0305	:	550	:	-0204	200.	:	.0203	.0320	.0315	.0301	.0307	.0558	
• 6	:	7040.	:	1/50.	:	9	:	2220.	20.	:	7/70.	1000	25.0	7650.	4240	9290	
2 2	:	.0493	:	.0301	:	2230.	:	.0223	0747	:	.0204	.0395	.0365	0.420	.0472	9600	
7	:	2667	:	2550	:	200	:	22.50		:	22.0	•	2473	0502	750	8000	
29		0010	: :	8070	: :	3390	: :	0270	.0043	: :	0330	: :	.0525	9550	0726	2100	
11	:	.0675	:	.0625		.070	:	.0280	1020	: :	.0366	:	.0578	.0631	.0858	8000	
78	:	.0748	:	.0792	:	.0756	:	.0316	:	:	0000	:	.0635	.0737	.1020	0601.	
2	:	.0838	:	2260.	:	.0813	:	.0332	:	:	.0448	:	9690.	:	.1214	8811.	
8	:	.0950	:	.1170	:	.0875	:	.0356	:	:	.0507	:	.0763	:	.1445	.1288	
8	:	. 1088	:	.1330	:	.0945	:	.0383	:	:	8 8 9	:	.0835	:	.1586	.1400	
27	:	.1230	:	.1500	:	.1020	:	.0400	:	:	.0750	:	.0915	:	:	:	
3	:	.1495	:	.1070	:	.1105	:	.0443	:	:	.1145	:	.1000	:	:	:	
\$ 3	:	.1020	:	:	:	.1200	:	.0475	:	:	. 1970	:	. 1095	:	:	:	
8	:	. 1930	:	:	:	.1310	:	.0508	:	:	.2050	:	.1193	:	:	:	•
8	:	.2330	:	:	:	.1475	:	.0545	:	:	:	:	.1293	:	:	:	37.
S	:	. 2730	:	:	:	.1080	:	.0583	:	:	:	:	1390	:	:	:	
88	:	.3110	:	:	:	:	:	.0025	:	:	:	:	01210	:	:	:	
2 6	:	.3500	:	:	:	:	:	.0070	:	:	:	:	.1023	:	:	:	
3	<u>: </u>				- - -				:	:			.1735	:			

TABLE 201—COMPARATIVE RATES OF DEATH IN ACTUAL PERFORMANCE OF DUTY, AND OTHER THAN IN ACTUAL PERFORMANCE OF DUTY

All Funds

	RATE OF DE	LATE IN PI	erforman	E OF DUTY	RATE OF DEA	TE NOT I	PERFOR	MANCE OF DUT
AGE	Fire Department Relief Fund	Depai Pensio	alth tment n Fund en	Police Pension Fund	Police Pension Fund	Depa Pensio	ealth rtment on Fund fen	Fire Department Relief Fund
	Aggregate	ist Year	Ultimate	Aggregate	Aggregate	ist Year	Ultimat	e Aggregate
15						.0018		
16						8100.		<i> </i>
17	•••	• • • •		• • •		8100.		
18				• • •		.0019	.0021	1
19			l l	• • •		.0020	.0022	/
20	1000.	.0000			.0026	.0020	.0023	.0033
21	.0002	.0001]	• • •	.0026	.0021	.0024	.0033
22	.0003	10001		.0001	.0027	.0021	.0026	.0033
23	.0004	10001	1000.	1000.	.0027	.0021	.0026	.0033
24	.0005	10001	1000.	.0002	.0027	.0021	.0028	.0033
25	,0006	.0001	.0001	.0003	.0028	.0021	.0029	.0034
26	.0007	.0001	.0002	.0003	.0029	.0021	.0030	.0034
27	.0000	.0002	.0002	.0003	.0031	.0022	.0032	.0034
28	.0010	.0002	.0003	.0004	.0034	.0023	.0034	.0034
29	.0011	.0002	.0003	.0004	.0037	.0024	.0036	.0034
30	.0012	.0003	.0004	.0004	.0040	.0024	.0037	.0034
31	.0012	.0004	.0006	.0004	.0045	.0025	.0038	.0034
32	.0012	.0006	.0009	.0004	.0049	.0025	.0038	.0035
33	.0013	.0007	1100.	.0004	.0054	.0025	.0039	.0036
34	.0013	8000.	.0012	.0004	.0059	.0026	.0041	.0036
35	.0013	.0000	.0013	.0004	.0063	.0028	.0043	.0037
36	.0013	.0000	.0014	.0004	.0068	.0029	.0045	.0038
37	.0014	.0000	.0014	.0004	.0073	.0032	.0049	.0038
38	.0014	.0010	.0015	.0004	.0077	.0035	.0052	.0040 .004I
39	.0014	.0010	.0015	.0004	.0080	.0037	.0056	.0042
40	.0014	.0010	.0015	.0004	.0082	.0041	.0060	.0043
41	.0014		.0015	.0004	.0084	1	.0065	.0045
42 43	.0014		.0015	.0004	.0086	1 /	.0070	.0048
44	.0013	• • • •	.0015	.0005	.0088	•••	.0075	.0050
45	.0013	•••	.0015	.0005	.0000		.0081	.0054
46	.0012		.0014	.0005	.0092			10001
47	.0012		.0014	.0006	.0095	1	.0095	.0073
48	.0012	1	.0013	8000.	.0099	1 1	.0103	1000.
49	.0011		.0012	8000.	.0109	1	.0111	.0111
50	.0000	• • • •	.0000	.0008	.0125	1 1		.0127
50 51	.0000	•••	.0006	.0008	.0144	1 1	.0130	,0140
52	.0007	:::	.0005	.0006	.0164	:::	.0150	,0149

*The Rate for the Department of Street Cleaning Pension Fund would Precede this Rate in Order if it were in Accordance with the Division which has been made for Valuation Purposes.

TABLE 201—COMPARATIVE RATES OF DEATH IN ACTUAL PERFORMANCE OF DUTY, AND OTHER THAN IN ACTUAL PERFORMANCE OF DUTY—Continued

Agz	*Fire Department Relief Fund	Depai Pensio	alth tment n Fund en	Police Pension Fund	Police Pension Fund	Depai Pensio	ealth rtment n Fund en	Fire Departmen Relief Fund
	Aggregate	1st Year	Ultimate	Aggregate	Aggregate	ıst Year	Ultimate	Aggregate
53	.0004		.0004	.0004	.0100		.0160	.0157
54	.0002		.0004	.0002	.0211	1	.0160	.0164
55	.0001	l	.0003	.0002	.0218	l	.0170	.0170
56	.		.0003	.0001	.0223	1	.0180	.0176
5 7	1		.0003	• • •	.0225	l	.o108	.0180
58		١	.0002		.0220	1	.0206	.0184
59	1		.0002	• • •	.0235	1	.0211	.0188
60	l		.0002	• • •	.0247		.0216	.0102
61	1	l	.0002	• • •	.0265	1	.0220	.0107
62	1	l	.0002		.0200	l	.0223	.0201
63	1	 	10001		.0320		.0227	.0206
64	1		1000.		.0355		.0231	.0214
65	1	l	1000.		.0393	 	.0233	.0210
66			1000.		.0432		.0237	.0220
67			1000.	• • •	.0472		.0240	.0239
68	• • • •		.0001		.0512		.0244	.0254
69			1000.		.0553		.0249	.0274
70	1		1000.	• • •	.0596		.0255	.0295
71			10001	• • •	.0642		.0262	.0320
72			.0001		.0692		.0271	.0351
73				• • •	.0747		.0284	.0395
74	1	•		• • •	.0807		.0298	
75				• • •	.0872		.0316	
76				• • •	.0943		.0339	
77				• • • •	.1020		.0366	
78	• • • •		• • • •	• • •			.0400	
79	•••			• • •	• • • •		.0448	
80				• • •			.0507	1
81				• • •			.0600	
82							.0750	
83	• • • •	• • • •		• • • •			.1145	
84	• • •			• • •			.1970	
85	• • • •			• • • •			.2650	
86					• • • •			
87	1							
88				• • •	• • • •			
89								l
90	1	1			l			l

^{*}The Rate for the Department of Street Cleaning Pension Fund would Precede this Rate in Order, if it were in Accordance with the Division which has been made for Valuation Purposes.

TABLE 202—COMPARATIVE RATES OF SEPARATION FROM ACTIVE SERVICE BY DISABILITY

PRINGEON			7						-	Heart	TRACHERS
FUND	RELI PERMI	STREET CLEANING RELIEF AND PERSION FUND	DEPARTMENT RELIEF FUND		ETTERMENT FOND WOMEN	COURT, FIRST DEPARTMENT RETIREMENT FUND	City of New Employe Retirement	r of New York Employace drement Fund		DEPARTMENT PERSION FUND MEN	RATHEMENT FUND MEN
Aggregate	1st Year	Ultimate	Aggregate		Aggregate	Aggregate	1st Year	Ultimate	in Year	Ultimate	Aggregate
:	;						:	:	1000	•	:
	:	:					.000	:	.000	:	:
:	:	;	:		:	:	.0003	:	.0002	:	:
	:	:	:		:	:	900	:	.000	.000	:
:	•					;	800	.0004	.0002	.0003	:
9000	1000		1100.				.0003	900	.000	.000	;
1000	1000	;	.0013		:	:	4000	,000÷	000	.0003	:
0000	1000	:	. 00IS		:	:	9000	000 500	.000	.000	:
00100	1000	1000	groo.		:	:	,000.	S000.	.000	,000	:
1100	1000	1000	8100.		:	:	7000	.0005	.0003	0004	:
.001	1000	1000.	.0020		:	:	2000.	9000	000	000.	:
\$100 .	1000	1000	.0022		:	:	2000.	9000	9000	000	:
9100.	1000	.0003	.0025		:	:	. 0005	_	9000	9000	:
0100	.0002	.0003	9000		:	:	2000.	<u>.</u>	.0004	900	:
,0022	.000	.0003	.0028		:	:	000	_	2000	.0007	:
.0025	.0005	9000.	.0030		:	:	900	_	2005	.000	:
6200.	oloo.	1100	.0032		:	:		6000	00.	800 800	:
.0034	. 0016	\$100	.0035		:	:	5000	Ė	<u>8</u> ,	0000	:
. 0039	.0021	.0023	.003 0		:	:	900	_	900	0000	:
.0040	.0030	.0030	.0044		:	:	000	_	000	000	:
2500.	.0031	.0035	0053		:	:	000	_	.0007	0100	:
2000	0.00	900	1000			:	3 8	3 8	9 6	8 8	:
3,68	200	200	200		9100	•		_	3	2	•
8110	9900	2000	0110		.0020		100	0010	9000	0012	1000
.0153	000	.0070	0130		5700	2000	SIO	_	9000	.0012	0000
7610.	:	.0075	.0135		7900	. 0018	:	-	:	.001	-
.0259	:	.0082	.0139		.0088	.0036	:	.0022	_		5
.0327	:	1000	0410.		.0103	0000	-	2	:	3	7000
0400	:	0010	000		0110.	8300	-		:	00.	2000.
.0473	:	0010	0130		.0113	900	:	9020	<i>Ξ</i>	8	9000
1000	:	2112	9		7110		:	.020	:	, E	2000
0.00	:	2000	A570.		.0114	1/3	:	.00	:	8	
0000		2770	10.0		2110.	.0075	:	0010			900
0686		0150	0148		9010	00.00	:	0700	:	3 3	8000
0689	::	6910	.0151		0000	.0083	:	700	:	2.00	0000
0680	: :	2010°	0157			4000	:	.0000	* '	2 5	0000
0			2010	1000.		Depo		1	:		3

TABLE 202—COMPARATIVE RATES OF SEPARATION FROM ACTIVE SERVICE BY DISABILITY—Continued

	Porton	DEPART	DEPARTMENT OF	FIRE	LABORERS*	ERS	MECHANICS	NICS*	TEACHERS'	SUPREME	CLERES	ES	HEALTH	LTH	TRACHERS'
AGE	PENSION	RELII PENSIO	TREET CLEANING RELIEF AND PRISION FUND	DEPARTMENT RELIEF FUND	City of New York Employees' Retirement Fund		City of New York Employees' Retirement Fund	ew York yees' at Fund	Ketirement Fund Women	DEPARTMENT RETIREMENT FUND	City of New York Employees' Retirement Fund	ew York	Departm Pension I Men	DEPARTMENT PENSION FUND MEN	Ketirement Fund Men
	Aggregate	ıst Year	Ultimate	Aggregate	1st Year	1st Year Ultimate	1st Year Ultimate	Ultimate	Aggregate	Aggregate	1st Year	Ultimate	1st Year	1st Year Ultimate	Aggregate
55	.0582	:	.0250	.0174	:	.0254	:	.089	2700.	.0087	:	8700.		4500.	.0028
20	.0527	:	.0281	.0170	:	.0260	:	010	1,00	9800	:	.00	:	.041	.833
57	.0470	:	.0325	.0185	:	.0283	:	IIIO.	1,00.	.0085	:	.0083	:	.0048	85 85
88	.0414	:	.0388	.0193	:	.0202	:	.0121	1,00.	.0083	:	800.	:	.0054	.0043
20.	.0354	:	.0500	.020	:	.0297	:	.0129	1,000.	.08%	:	9084	:	1900:	.0049
8:	.0306	:	.0670	.0212	:	.0299	:	.0136	1700.	.0077	:	800.	:	.0068	.0056
7 5	.0204	:	0180.	.0222	:	.0208	:	.0140	.0070	.0072	:	.00 88	:	.0074	,000 4
7 6	.0227	:	.0935	.0235	:	.0203	:	.0143	0,00,0	2000	:	1800	:	.827	.0073
3 2	9100	:	.1045	.0250	:	4020.	:	.0143	6000	0000	:	6700	:	880	. 6002
8		:	1330	9200	:	2/20.	:	0410	900	158.	:	4 6	:	3 8	9,5
8	0010	: :	1278	9220	: :	0227	: :	200	000	2 6	:	3,6	:	8	6,00
67	0900	: :	.1332	0364	: :	0180	: :	0110	47,00	8 8 8	: :	800	: :	882	.0062
8	.0045	:	.1385	.0412	:	.0147	:	.0107	4400	7100.	:	.0043	:	.0077	.0044
8	9000.	:	.1440	.0474	:	0010	:	800	.0030	.8013	:	.0035	:	6900.	.0022
2	:	:	.1488	.0547	:	.0085	:	.0075	1000	0100	:	.0028	:	900.	9000.
12	:	:	.154o	:	:	.0067	:	1900.	:	.000	:	.0023	:	.0050	:
7 (:	:	. 1590	:	:	.0054	.:	.0051	:	800 500	:	8100.	:	.0043	:
2.5	:	:	. 1638	:	:	.0044	:	.0043	:	4000.	:	S18	:	.0036	:
* :	:	:	.1685	:	:	.0037	:	.0030	:	.000	:	.0012	:	.0031	:
25	:	:	.1720	:	:	.0030	:	80 90	:	1000	:	8.0	:	.0030	:
2:	:	:	.1700	:	:	.0025	:	. 8025	:	:	:	800	:	.00	:
200	:	:	.1795	:	:	.0030	:	9050	:	:	:	8	:	.0017	:
2 2	:	:	0201	:	:	010	:	7100	:	:	:	9000	:	418	:
8		:	1887	•	:	3 6	:	3 5	:	:	:	3 8	•	2 6	: ;
8	::	: :	8101.		: :	8	: :	80	: :		: :	000	: :	8	:
8	:	:	. 1945	:	:	00	:	9000	:	:	:	:	:	:	:
3	:	:	.1972	:	:	:	:	.0004	:	:	:	:	:	:	:
\$;	:	:	. 2000	:	:	:	:	.000	:	:	:	:	:	:	:
န္တ	:	:	. 2030	:	:	:	:	:	:	:	:	:	:	:	:
0 6	:	:	.2050	:	:	:	:	:	:	:	:	:	:	:	:
2 0	:	:	. 2075	:	:	:	:	:	:	:	:	:	:	:	:
88	:	:	2100	:	:	:	:	:	:	:	:	:	:	:	:
8	:	:	.2135	:	:	:	:	:	:	:	:	:	:	:	:
	:::							:					:		

eN. B.-This rate is that of disability without pension; the disability with pension is shown on table 204.

	382									9	SE	C?	ri	Ol	N	ľ	7																			
OCCURRING IN THER THAN IN		Heakh Department Pension Fund	Ultimate	:	:	:	:	: :	: :	:	:	:	:	:	:	:	•	: :	:	:	:	:	:	: :	:	:	:	:	:	•			: :	1000	1000	
	CE OF DUTY	Fire Department Relief Fund	Aggregate	:	:	:	:	1100	.0013	.0015	9100.	8100.	6100	.0021	.0023	.0024	8200	930	.0032	.0035	.0037	4400	8.00	7000	8010.	6110.	,0124	.0128	.0136	.0133	.0134	.0136	.0138	.0142	0146	0.50
BY DISABILITY Y OCCURRING O	NOT IN PERFORMANCE OF DUTY	nent of leaning and Fund	Ultimate	:	:	:	:	:	::	:	:	:	:	:	:	: 60	1000	8000	.0015	6100.	.0025	.0030	55.5	7400	.0056	.0064	6900.	.0070	886	0010	oi io.	.0120	.0130	.0141	.0152	0170
m	Not in	Department of Street Cleaning Relief and Pension Fund	ist Year	:	:	:	:	: :	: :	:	:	:		8	000	8 8	8	.007	.0013	7100.	.0022	.0027	188	. 00	.0051	.0058	:	:	:		:	:	:	:	:	: :
TIVE SERVICE I BY DISABILITY		Police Penalon Fund	Aggregate	:	:	:	:	• !	: :	:	:	:	:	:	:	:	. 000	9000	1100.	9100.	.0023	.0032	. 500.	9200	.0107	.0145	0010	.0254	5550	0470	0530	.0503	.0638	.0667	.0584 4860	64yo.
SEPARATION BY I		nent of caning and Fund	Ultimate	 :	:	:	:		: :	:	1000	1000	1000	1000	.0002	8 8 8 8 8	800	8	.000	4 000.	.0004	2000	8 8	900	9000	9000.	9000	0000	8,8	9000	.0005	.0005		,0004	4000.	8 8
—		Department of Street Cleaning Relief and Pension Fund	1st Year	:	:	:	:	1000	1000	1000	1000	1000	100		100	2 8	800	80	.88	4000.	.0004	.0004	8 8	8	.0005	9000.	:	:	:			:	: :	:	:	::
OF SEPARATION RATES OF SE	CE OF DUTE	Fire Department Relief Fund	Aggregate		:	:	:	•	: <u>.</u> :	:	:	:	1000	1000	.0002	.000	500	.000	.0003	9000	.0007	600	90100	1100	1100.	1100.	1180.	1100.	900	3000	7000	000	.0003	.000	.0002	.0002
ATES Y ANI	IN PERFORMANCE OF DUTY	ith ment Fund	Ultimate	:	:	: :	8.6	3 8	.000	.0003	•	7 000		.005	0000	0000	200	8000	6000	6000	0100	0100	1180	.0012	.0012	.0012	.0012	.0013	25.5	2100	818	\$100.	.0015	.0015	.0016	6100 6100
£ 6	Ŋ	Health Department Peasion Fund Men	1st Year	1000.	.000	.000	8 8	2 8	.0003	.0003	.0003	.003	.003	9000	7000	4000	200	2000.	9000.	9000	9000	.0007	8 8	800	8000.	8000.	:	:	:	: :	: :		::	:	:	::
ILE 203—COMPARATIVE PERFORMANCE OF DU PERFORMANCE OF DU		Police Pengion Fund	Aggregate		:	:	:	9000	2000	6000	0100	1100	.0012	.0014	0100	9100.	.0033	.0023	.0023	.0023	.0023	.0023	22.50	8100	1100.	8000.	.0007	.0005	9 2	2000	.0003	.0002	.0002	.0002	.0002	1000
TABLE 203- PERFOR PERFOR		AGE		15	16	17	9 9	2 2	21	22	ឌ	* .	57	9 5	7 0	9 8	8	31	32	83	4	0 0	3.7	38	39	\$	4.	4 4	3 4	45	\$	47	48	64	တို	51 52

TABLE 203—COMPARATIVE RATES OF SEPARATION BY DISABILITY OF PERFORMANCE OF DUTY AND RATES OF SEPARATION BY DISABILITY OF PERFORMANCE OF DUTY—Continued

TABLE 204—COMPARATIVE RATES OF SERVICE RETIREMENT

tck New York The Cky of Clty of Chanks es Employees New York Employees Reliement Retirement Readon Readon
*Mechanica City of New York Employees' Retirement Fund
Men —— Teachers' Retirement Fund
Supreme Court First Department Retirement Fund
Second Department Retirement Fund
Men Health Department Pension Fund
Women Teachers' Retirement Fund
Police Pension Fund
Fire Department Relief Fund
Y.

*N. B.—These rates are those for retirement on pension after 30 years service in case of disability.

TABLE 204—COMPARATIVE RATES OF SERVICE RETIREMENT—Continued

YE Y	Fire Department Relief Fund	Police Pension Fund	Women Teachers' Retirement Fund	Men — Health Department Pension Fund	Second Department Retirement Fund	Supreme Court First Department Retirement Fund	Men — Teachers' Retirement Fund	*Mechanics City of New York Employees' Retirement Fund	*Clerks City of New York Employees' Retirement Fund	College of The City of New York Retirement Fund	*Laborers City of New York Employees' Retirement Fund	Department of Street Cleaning Relief and Pension Fund
8	. 1820	.1568	1745	.0840	.0548	0130.	9940.	.0358	.0386	.0247	.0304	.0525
29	. 2060	.1415	. 2040	0000	.0583	.0561	9160.	.0403	.0428	.0268	.0343	.0589
8	. 2400	.1316	. 2430	1/60.	9290.	6090.	8011.	.0458	.0478	7620.	.0386	.0657
8	.2930	.1309	. 2890	. 1057	.0672	.0659	.1326	.0523	.0535	.0328	.0436	.0727
2	.3500	. 1508	.3370	.1157	.0730	0170.	. 1680	8650.	5 090.	.0363	.0490	7670.
7	.4500	9961.	.3880	. 1285	.0777	.0770	. 2075	8690.	9690	.0408	.0555	.0878
72	.7500	.2727	.4400	.1440	.0835	.0830	. 2505	.0820	.0825	.0458	.0625	og 6o .
23	5096.	.3732	. 5040	. 1640	6680.	2680.	. 2980	2960.	. 1030	.0521	0110.	. 1050
7	:	.4952	.\$660	0061	2960.	.0965	.3470	.1142	. 1400	2090.	0810	.1142
75	:	.6226	.6280	. 2260	1901.	0401.	.3980	.1460	. 1850	.0724	.0925	. 1242
9	:	. 7445	90,	. 2720	.1125	.1125	.4510	. 1950	. 2380	.0936	. 1065	.1350
11	:	.8502	. 7820	.3230	. 1215	.1215	. 5060	. 2390	.3025	.1350	.1225	.1470
78	:	.8897	.8790	.3730	.1310	.1310	. 5630	. 2860	.3775	.2400	1400	. 1597
2	:	:	986.	.4210	.1420	.1420	.6240	.3500	.4575	4000	. 1590	. 1728
8	:	:	:	.4740	.1543	.1543	0689	.4100	.5450	.7440	. 1780	.1870
20	:	:	:	.5330	. 1675	. 1675	0197	.4680	0400	.8600	. 1985	. 2030
82	:	:	:	. 5910	. 1830	. 1830	:	. 5270	. 7300	:	. 2215	. 2200
3	:	:	:	. 6460	. 2010	. 2010	:	.5800	.8350	:	. 2550	. 2380
\$:	:	:	. 700	. 2225	.2225	:	.6350	.9500	:	2000	. 2590
20	:	:	:	.7450	. 2490	. 2490	:	0269.	:	:	.3380	. 2810
8	:	:	:	:	. 2850	. 2850	:	. 7620	:	:	.400	.3000
24	:	:	:	:	.3375	.3375	:	.8270	:	:	.4725	.3310
28	:	:	:	:	.4250	.4250	:	.8950	:	:	. 5050	.3010
20	:	:	:	:	.5900	2000	:	.9650	:	:	.6750	.3920
8	:	:	:	:	.8265	.8265	:	:	:	:	8	:

*N. B.—These rates are those for retirement on pension after 30 years service in case of disability.

Table 205 on page 387 gives, for comparative purposes, the rates of salary increase for the various departments, that is the ratios between the salary of each age and the salary at the age next above it. Since these ratios are based on average salaries for considerable groups they are m necessarily applicable to individuals within the group, because the increase as shown by the salary rate may result in one extreme case from a comparatively small increase common to practically all the individuals of the group or it may result in the other extreme case from comparatively large increases confined to a few individuals of the group. The rates are, however, indicative of the trend of the salary of the average employee. The rates are not shown beyond age 44, as in some departments the average salaries began to decline after that age. It should be noted that these rates are presented merely for the purpose of permitting a comparison of the trend of the salaries in the different departments and branches of the service; and they are broadly comparable. They were not used in the actual valuation. For that work salary scales were used graduated from the actual average salaries of the employees, classified by age, according to the method described on page 31.

TABLE 205-RATES OF SALARY INCREASE

College City of Retirement Reducent Reducent Reducent Reducent Reducent Rund City of Stand Stand City of Stand City of	Clerks City of New York Employees' Retirement	10,000		Mechanica				Tobone	
150 150 115 115 115 107 107 107 107 107 107 107 107 107 107	Fund	Department Penalon Fund Men	Teachers' Retirement Fund Women	City of New York Employees' Retirement Fund	Police Pension Fund	Fire Department Relief Fund	Supreme Court Retirement Fund	City of New York Employees' Retirement Fund	Department of Street Cleaning Relief and Pension Fund
250 212 212 200 200 200 200 200	.207	.143	810.	100	440.	.83	.049	.077	110.
012 012 000 072 000 000 000	691.	.136	.025	\$60.	440.	.012	.047	.063	.013
215 202 203 200 200 200 200	.125	011.	.032	620.	840.	.034	.050	.047	010.
	001.	880.	040	.072	.051	.057	.045	.038	6 0.
	.078	.075	.051	.063	150.	.073	440.	.032	%
	.057	290.	1 9.	.056	.054	.053	140.	.032	8.
.005	.043	.051	.059	.047	.052	.057	.036	120.	900.
.057	.031	.042	890.	040	.049	.033	.036	910.	700.
	.030	.038	.062	.035	.046	.031	.030	710.	9 0.
.050	.025	.031	.058	.030	.042	920.	620.	010.	\$00.
	.023	920.	.052	.025	.038	.023	.027	6	400.
.043	610.	.022	0 1 0	.022	.033	.020	.024	9 0.	100.
-	710.	610.	0 1 0	610.	.028	610.	120.	400.	80.
.040	810.	710.	.044	.013	.025	.025	810.	.002	100.
_	910.	ors.	.042	010.	.020	.021	810.	100.	100
.037	.015	910.	.034	88	710.	.027	.013	100.1	100
.032	.013	010.	.031	.00	410.	.029	110.	8 1	100.
.030	.015	8	.028	98.	.012	.029	6 8.	8 !	100
.029 0.	. 110.	8	.025	9	110.	610.	400.	18. I	100
.028	.012	.87	.020	.00	010.	.033	400.	1.80	100
	010.	98.	610.	8	8	.022	.8	1.004	100.
.022	010.	<u>%</u>	410.	8.	8.	610.	.83	180.	100.
.024	.80	.002	910.	8.	98.	oro.	.8	1.002	8.
	.87	.00	210.	8.	900.	o.	8	100.1	
.021	.00.	8	.013	8.	900.	910.	8.	1.002	8
	-	_	_	_	_	-	_		

TABLE 206-COMPARATIVE RATES OF MOR

4 11

Lge	Department of Street Cleaning Relief and Pension Fund	Supreme Court First Department Retirement Fund	Fire Department Relief Fund	Health Department Pension Fund	Teachers' Retirement Fund Men	Police Pension Fund	Teache Retirem Fund Wome	CE
20	. 2080		.4578	. 1200	•••	. 2210		_
21	. 2070		.4485	.1157		-2110	• • • •	
22	. 2050	• • • •	.4338	.1110	• • •	- 2060	· · · ·	
23	. 2030		.4150	. 1067		. 1080	• • • •	
24	. 2010	• • • •	-3995	. 1023		- 1885	}	
25	. 1992		-3475	.0982	• • •	-1700	1	
26	. 1975		. 2750	.0944		. 1687	• • • •	
27	. 1960	• • • •	. 2200	.0006		.1573)	
28	. 1940	• • • •	. 1850	. 0869		- I452		
29	.1920	• • • •	. 1600	.0833	• • •	1341		
30	. 1900	• • • •	. 1417	. 0800		· 1230	1	
31	.1880	•	. 1278	.0765	• • •	.1140		
32	. 1862		.1175	.0734		.1050		- 1
33	. 1845		. 1090	.0704	• • •	.9067]	- 1
34	.1822		. 1015	.0673		- 0890		- 1
35	. 1805	• • •	.0952	.0644		.0818		- 1
36	. 1780		.0900	.0615	• • •	.0753	• • • •	- 1
37	. 1758	• • • •	.0858	.0587		.0695		١
38	. 1735		.0820	. 0560	.0280	.0642	• • •	- [
39	.1710	• • • •	0788	.0533	.0297	.0502	-0241	1
40	. 1688	.0850	.0758	.0509	.0313	.0547	-0244	1
41	. 1663	.0850	.0734	.0487	.0327	.0506	. 0247	1
42	.1640	. 0850	.0712	.0465	.0339	.0472	-0250	ı
43	.1617	.0860	.0692	.0444	.0354	-0441	-0253	1
44	.1595	.0860	.0677	.0425	.0367	-0418	-0257	1
45	.1570	.0870	.0662	.0408	.0382	-0398	· 026o	1
46	.1545	. 0880	.0650	.0393	.0388	.0398	- 0264	1
47	. 1520	.0880	.0640	.0381	.0394	-0370	-0268	ı
48	.1493	. 0890	.0632	.0371	.0400	.0362	.0272	•
49	.1468	. 0900	.0628	.0363	.0405	.0357	-0278	ı
50	.1440	.0910	.0622	.0356	.0409	-0353	.0283	
51	.1415	.0920	.0620	.0352	.0412	.0352	-0290	
52	. 1385	.0940	.0618	.0350	.0416	-0353	-0296	
53 54	. 1358	.0960	.0618	.0353	.0418	.0358	.0302	
	.1330	.0990	.0619	.0358	.0421	.0362	.0311	
55 56	.1302	. 1010	.0622	.0365	.0423	.0362	.0320	
50 57	.1280	. 1030	.0627	.0376	.0425	-0379	.0329	
57 58	.1255	. 1050	.0634	.0389	.0426	.0379	.0340	
58 59	.1236	. 1070	.0640	.0405	.0429	.0402	.0350	
	. 1220	. 1090	.0650	.0424	.0432	-0410	.0363	
60 61	. 1 205	.1110	.0660	.0449	.0436	0435	.0377	
	.1102	.1130	.0671	.0474	.0453			

TALITY AMONG DISABILITY PENSIONERS

Funds

Age	Department of Street Cleaning Relief and Pension Fund	Supreme Court First Department Retirement Fund	Fire Department Relief Fund	Health Department Pension Fund	Teachers' Retirement Fund Men	Police Pension Fund	Teachers' Retirement Fund Women
62	.1185	.1140	.0685	.0503	.0460	.0471	.0427
63	.1180	.1140	.0700	.0535	.0500	.0492	.0448
64	.1185	.1150	.0713	.0570	.0553	.0514	.0467
65	.1104	.1150	.0730	.0608	.0602	.0538	.0488
66	.1208	.1150	.0750	.0650	.0634	.0562	.0513
67	.1230	.1150	.0772	.0692	.0667	. 0589	.0539
68	. 1 2 6 2	.1150	.0795	.0739	.0700	.0618	.0560
69	. 1302	.1150	.0820	.0789	.0738	. 0646	.0600
70	. 1360	. 1150	.0850	.0843	.0775	.0675	.0633
71	.1430	. 1160	. 0882	.0909	.0812	.0710	.0671
72	.1520	. 1 1 60	.0920	.0977	.0848	.0742	.0714
73	. 1610	.1160	.0960	. 1050	.0882	. 0780	.0759
74	.1725	.1170	. 1000	.1135	.0914	. 0819	.0810
75	. 1825	. 1180	. 1050	.1220	.0944	. 0860	.0866
76	. 1940	.1190	.1105	. 1316	. 1023	. 0908	.0930
77	. 2050	. 1210	. 1 1 6 3	. 1420	.1111	.0955	.1000
78	. 2180	. 1 2 60	. 1230	.1533	. 1 208	. 1014	. 1080
79	. 2325	. 1330	. 1300	. 1655	.1317	. 1079	.1165
80	. 2500	. 1445	. 1382	. 1800	. 1445	.1153	.1260
81	. 2675	. 1586	. 1480	. 1965	. 1586	.1245	.1370
82	. 2875	.1743	. 1580	.2140	.1743	.1354	.1483
83 84	.3085	. 1916	. 1690 . 1815	. 2340	.1916	. 1495	. 1605
85	.3302	.2114	.1015	. 2560 . 2820	.2114 .2356	. 1655 . 1850	.1725
86	.3560	. 2356	. 1900	.3100	. 2350	. 1050	
87	. 3802	. 2657			.3030	. 2380	. 1990 . 2140
88	.4100 .4400	.3030	. 2310 . 2530	. 3450 . 3860	.3467	. 2360	.2200
89	.4700	.3467	. 2530	.4280	3959	.3135	.2450
90	.5050	3959 4545	.3075	.4700	.4546	·3575	.2630
91	.5450	.5325	.3475	.5150	.5325	.4100	.2825
92	.5000	.6343	.3925	. 5600	.6343	.4650	.3030
93	.6350	.7342	.4450	.6100	.7342	. 5300	.3240
94	.6850	.8571	.5025	.6640	.8571	.6050	.3465
95	.7350	1.0000	. 5800	. 7260	1.0000	.6850	.3710
96	.7900		.6750	. 7980		. 7700	.3970
97	.8500		.7700	.8880		8630	.4250
98	.0150		.9750	. 9850		. 9600	.4550
99	.9800		1.0000	1.0000	l		.4880
100	1.0000		• • •		I		.5240
101			• • •			• • •	.5590
102		• • •	• • • •	• • • •		• • •	.6000
							<u> </u>

TABLE 207—COMPARATIVE RATES OF MORTALITY AMONG SERVICE PENSIONERS

.0293 .0294 .0223 .0294 .0223 .0240 .0318 .0340 .0358 .0258 .0258 .0350 .0350 .0350 .0350 .0350 .0299 .0397 .0391 .0299	0272 0338 0397 0397
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TABLE 207—COMPARATIVE RATES OF MORTALITY AMONG SERVICE PENSIONERS—Continued

Fire Teachers' City of New York City of New York Redirement Fund Employees' Employees' Employees' Fund Men Retirement Fund Retirement Fund	Teachers' City of New York
	Men Retirement Fund
8690.	. 6000.
.0738	.0738
. 0778	. 0778
0824 0823 .0802 .0750	.0823
.0033	.0033
.0999	. 6000.
. 1111. 0701.	1111. 0701.
.1152 .1208	.1152 .1208
1248	1248
1358	1358
1497	1500
2420 1820 1016	1820
. 2020	. 2020
2356	. 2250 2356
. 2525	. 2525
. 2840 . 3030	. 2840 . 3030
.3180	.3180
. 3580	. 3580
. 4545	. 4545
. 4500	. 4500
. 5110 .0343	. 5110 .0343
. 5750	. 5750
.0500	. 0500
. 7340 I.0000	. 7340 I.0000
08180	08180
o886.	
•	
:	:
::	:::
: : : : : : : : : : : : : : : : : : : :	
: : : : : : : : : : : : : : : : : : : :	
::	

DEVELOPMENT OF ADJUSTED TOTAL SEPARATION RATES BY USE OF STANDARD SERVICE

The rates given in the preceding tables are in the form required for valuation purposes, but because of their number (a rate is required for each single age) and because of the differences between departments as regards the age distribution of employees, it is very difficult to obtain a general idea of the comparative mortality or service experience of employees in the various departments. Crude rates of separation are sometimes cited to show such differences, but they are often misleading. Crude pension fund separation rates are, if anything, more affected by differences in the age distribution of the body of persons to which they relate than are crude population death rates. In population vital statistics the advisability is recognized of using standardized death rates, which eliminate differences arising solely from differences in age distribution and make the rates show only differences in mortality. An attempt has been made, for this report, to develop index figures for each department which are comparable with similar figures for every other department and which supply a single statistical measure of service conditions.

In actuarial work the mortality of different classes is frequently compared by means of the ratio of actual cases of death to the number to be expected according to a certain standard mortality rate. Such a method is not affected by the differences in age distribution in the exposed to risk, since the standard rate and the actual rate are both applied to the same exposure by ages. While the ratios obtained by this method are reliable comparative figures, the application of the method requires the use of a standard rate. No standard rates were available for comparison with the various rates of separation derived from the pension funds, and although a set of rates to be used as a standard could have been developed from a combination of all the experience available, this procedure was not adopted. Instead, a standard exposure column was prepared. Such column is used in the same way that the standard population is used in population vital statistics for computing standardized death rates. The various rates of separation from the service were applied to the standard exposure column by age and the expected separations were thus derived. These expected separations were then summed and the total divided by the corresponding total of the exposed to risk for these ages. The resulting ratio is what may be called a standardized total rate of separation for the cause and service to which the rate is applicable.

The age distribution adopted for the standard exposure column is, broadly speaking, that obtaining among all employees on the active service rolls of the various departments of the city service combined; and the distribution by length of service, that obtaining among all employees on the active rolls of those departments or branches of the service for which it seemed necessary to develop select rates combined. The exact distribution adopted is immaterial, so long as the standard selected may be regarded as reasonably like an average service. The figures on which the present stand-

ard is based have therefore been smoothed by graduation and increased so that the total exposure for all ages combined is one hundred thousand.

As the select rates are not shown above age 40 for the first year of service the standardized rates are somewhat affected by the use of the ultimate column only beyond that age; however, these differences may be safely disregarded in this case.

In the following tables the details of the sheets on which the standardized rates were prepared have been summed by five year groups and are shown for the central age of each group. The ultimate and aggregate rates, however, were multiplied into the exposure age by age; the aggregate rates into the aggregate exposure column, and for the departments where the select rates were used the ultimate rates into the ultimate column. In applying the select rates to the respective exposure columns, however, it was considered sufficient to combine the exposure in five year age groups and to apply the central rate. The sum of the results for the four select exposure columns were combined and the resulting total for each five year group was then treated as if it had been obtained by the use of an aggregate rate. In presenting the results the exposure employed is first shown and then the tables of expected cases. Attention is called to the fact that the expected service retirements are only for ages below 65 and consequently do not include the total experience.

TABLE 208—SUMMARY OF STANDARD EXPOSURE COLUMNS EMPLOYED IN THE CALCULATION OF STANDARD RATES OF SEPARATION

Central Year of Age Group	First Year of Service	Second Year of Service	Third Year of Service	Ultimate Years of Service	Aggregate Years of Service
22	2,453	2,203	1,728	2,350	8,734
27	3,061	3,082	2,765	7,694	16,602
32	1,982	2,138	1,960	11,693	17,773
37	1,352	1,404	1,504	12,285	16,545
42	198	380	733	12,354	13,665
47			• • • •	10,599	10,599
52				7,854	7,854
57				5,197	5,197
62	.:.		• • • •	3,031	3,031
otal	9,046	9,207	8,690	73,057	100,000

All Funds

TABLE 209—STANDARD EXPECTED SEPARATIONS FROM SERVICE ON ACCOUNT OF WITHDRAWAL OBTAINED BY USE OF THE GRADUATED RATES AND THE STANDARD EXPOSURE

394 SECTION IV Fire Department Relief Fund 151.7 68.4 18.7 18.7 10.0 811.3 41.6 56.2 25.0 6.0 0.0 1.01 : : Supreme Court Retirement Fund 343.7 233.8 138.3 67.3 28.8 1,100.7 : : : : : : : : : : 13.1 5.6 322.5 227.9 126.1 77.8 28.5 163.3 67.3 24.5 11.2 489.5 Police Pension Fund 199.3 160.6 101.6 9.99 25.5 1,164.5 Teachers'
Retirement
Fund
Men 313.2 166.4 86.8 1,311.5 : : 480 0 : : Teachers'
Retirement
Fund
Women 344.4 980.9 680.9 261.9 82.9 83.9 8.8 2,384.5 : WITHDRAWALS Department of Street Cleaning Relief and Pension Fund RESIGNATIONS 1,136.3 713.5 711.5 275.6 165.9 106.9 24.9 303.3 382.7 2261.3 178.88 89.5 45.4 10.0 2,568.5 558.4 753.6 462.2 332.7 186.1 120.5 1,297.2 DISMISSALS 3,865.7 2.04.0 All Funds TOTAL Mechanica City of New York Employees' Retirement Fund 849.3 1,508.6 1,104.5 783.1 442.6 724.4 1,273.8 859.2 547.3 304.7 161.6 234.8 245.3 245.3 235.8 1,082.6 79.I 54.7 32.I 4.080.7 3,907.1 College of the City of New York Retirement Fund 1,567.1 :|| 485.8 891.9 305.6 133.0 5,511.3 : : : : : : Laborers City of New York Employees' Retiremen: Fund 1.9424 1,463.3 1,197.8 880.8 499.4 306.9 187.7 90.1 ,056.7 826.6 406.6 371.2 307.2 197.9 573.6 301.5 180.1 3,782.2 5,558.3 Clerks City of New York Employees' Retirement Fund 9.610,1 1,249.3 1,449.7 908.8 283.0 138.9 155.6 222.1 216.7 193.7 126.7 75.3 39.7 947.7 1,471.4 1,666.4 1,102.5 449.7 99.2 40.0 5,245.5 6,258.1 576. 423.5 Health Department Pension Fund Men 25.9 25.9 20.9 11.5 730.5 1,750.3 1,618.1 1,321.8 27.9 1,638.2 1,533.2 1,264.1 687.8 723.7 333.0 109.4 312.1 97.9 6,193.7 6,617.2 Totals Totals Totals Central Vear 228844889 22224455

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TABLE 210-STANDARD EXPECTED SEPARATIONS FROM SERVICE ON ACCOUNT OF DEATH OBTAINED BY USE OF THE GRADUATED RATES AND THE STANDARD EXPOSURE

TOTAL DEATHS FROM ALL CAUSES

					IOIAL DEAIRS	S F NOM ALL	CAUSES				
Central Year of Age Group	Laborers City of New York Employees' Retirement Fund	Clerks Clty of New York Employees' Retirement Fund	Mechanica City of New York Employees' Retirement Fund	Department of Street Cleaning Relief and Pension Fund	Police Department Pension Fund	Health Department Pension Fund	Fire Department Relief Fund	Supreme Court Retirement Fund	Teachers' Retirement Fund Women	Teachers' Retirement Fund Men	College of the City of New York Retirement Fund
22	49.9	47.8	29.6	40.8	24.5	20.8	32.3	30.7	15.0	15.3	18.0
32	182.2	150.1	100.00	158.9	24.7	79.6	4.4.	89.6	61.7	100.0	48.7
5 4 2 2	230.4	173.2	139.9	0.601	120.0	99.0	80.7	90 04.00	4.49 4.4	85.3	54.3
47	242.5	204.0	177.3	128.5	0.711	122.6	93.0	8.00	62.9	33.2	54.7
57	214.8 163.8	216.6	184.2	99.7 70.3	144.1	121.2	119.4	80.5 65.7	66.5 61.8	4.14	55.I
62	106.9	98.6	98.7	44.6	87.8	6.79	6.09	48.7	52.5	46.4	62.4
Total.	1,570.2	1,348.2	1,116.6	981.6	893.0	781.5	720.3	672.2	499.3	452.8	442.3
				DEA	DEATHS IN PERFORMANCE	RFORMANCE	OF DUTY				
22	:	:	:	4.9	0.1	9:	3.0	:	:	:	::
27	:	:	:	14.3	5.5	3.4	14.5	:	:	:	:
32	:	:	:	19.9	7.0	14.4	22.0	:	:	:	:
£ 5	:	:	:	21.2	6.7	22.0	23.0	:	:	:	:
47	: :	: :	: :	10.01	9.6	12.7	12.1	: :	: :	: :	: :
23	:	:	:	12.6	4.5	4	9.4	::	:	:	:
22	:	:	:		£.	4.1	H.	:	:	:	:
0.7	:		•	5.0	•••	o.	•		:	:	
Total.	:	:		123.4	38.6	81.4	97.1	:	:	::	
				1	DEATHS FROM	OTHER	CAUSES				
22	:	:	:	35.9	13.5	20.2	29.3	 -	:	:	:
27	:	:	:	9.66	52.9	49.0	55.8	:	:	:	:
32	:	:	:	139.0	87.7	65.1	62.4	:	:	:	:
2	:	:	:	147.0	119.2	70.9	. to	:	:	:	:
4 4	:	:	:	130.I	117.2	95.0	0 0	:	:	:	:
23	: :	: :	: :	87.1	130.6	116.4	114.8	: :	::	::	::
21	:	:	:	61.3	117.1	4. IOI	93.0	:	:	:	:
62	:	:	:	39.0	87.8	67.3	6.09	:	:	:	:
Total.	:	:	:	858.2	854.4	700.1	623.2	:	:	:	:

EXPECTED SEPARATION FROM SERVICE ON ACCOUNT OF DISABILITY OBTAINED BY	OF THE GRADUATED RATES AND THE STANDARD EXPOSURE
EXPECTI	USE OF THE
E 211-STANDARD	OSI

396		S	EC1	OIT	N	I	7															
AINED BY	Teachen' Retirement Fund Men	9 H M G H G H G H G H G H G H G H G H G H	68.9		:	:	:	: :	: :	:	: :					:	:	:	:	:	:	::
ON ACCOUNT OF DISABILITY OBTAINED BY STANDARD EXPOSURE AUSES	Health Department Pension Fund	8 4 4 1 1 1 1 2 4 2 4 4 1 1 1 2 1 2 1 2 1	139.4		2.8	4.8	14.3	17.5	15.2	12.3	o. v	04.0			:		•	:	:	:		1 K
OF DISAB XPOSURE	Clerks City of New York Employees Retirement Fund	3.5 10.1 15.4 22.2 29.7 29.7 48.3 48.1 42.4	234.3		:	:	:	: :	: :	:	: :				:	:	:	: :	•	: :	: :	::
ON ACCOUNT OF DISAI STANDARD EXPOSURE: AUSES	Supreme Court First Department Retirement	67.83.6 67.83.6 6.9.9	253.8	DUTY	::	:	:	: :	: :	:	•				•	:	<i>:</i>	:	:	:	:	: : :
THE THE	Teachers' Retirement Fund Women	15.4 109.7 108.7 108.7 108.7 10.5	364.4	OF	:	:	:	: :	: :	:	:		OTHER CAUSES	:	:	:	:	: :		: :	: :	: /
PARATION FROM SERVICE SUATED RATES AND THE All Funds TOTAL DISABILITY FROM ALL C	Mechanics City of New York Employees Retirement Fund	0.884 0.884 0.884 0.088 0.088 0.098 0.098	367.5	IN PERFORMANCE	:	:	:		: :	:	:		FROM	::	:	:	:	:	:	:	::	
D SEPARATION GRADUATED I	Laborers City of New York Employees' Retirement Fund	10. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4.	753.4	DISABILITY I	::	:	:	•	: :	:	•		DISABILITY	-	:	•	:	:	:	: :	:	
ECTED SE THE GRAI	Fire Department Relief Fund	13.5 64.4 138.4 188.4 186.3 123.2 96.2	882.1	ı	:	7.7	, o i	14.0	, eo	0.1	Ħ.	48.0		13.5	38.0	57.7	7.0.0	144.3	122.2	1,06	74.3	836.2
TABLE 211—STANDARD EXPECTED SEPARATION FROM USE OF THE GRADUATED RATES ALL FUE ALL FUE TOTAL DISABILITY F	Department of Street Cleaning Relief and Pension Fund	2.6 31.3 31.3 113.9 131.7 144.5 175.1	948.5		9.	2.5	က် တို့ ရ	0 00	. 0.	•	۰۰	34.8		::	+ .	25.7	9 5	126.1	142.1	174.2	013.2	7.6.6
211—STAN	Police Pension Fund	8.0 27.6 61.6 133.1 356.8 526.8 249.8	2,048.5		8.0	27.6	6.0	24.3	2.7	0.1	4.	110.8		::	:`	20.0	0.00	610.6	525.3	249.4	1.038.7	
TABLE	Central Year of Age Group	27 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Total		22	27	32	2 4	4.7	25	57	Total		22	27	325	. 4	47	25	57		

TABLE 212—STANDARD EXPECTED SEPARATIONS FROM SERVICE ON ACCOUNT OF SERVICE RETIREMENT OBTAINED BY USE OF THE GRADUATED RATES AND THE STANDARD EXPOSURE

Central Vear of Age Group	Fire Tal Department Relief	Police Pension Fund	Teachers' Retirement Fund Women	Health Department Pension Fund	*Supreme Court Secont Department Retirement Fund	Supreme Court Front Department Retirement Fund	Teachers' Retirement Fund Men	*Mechanica City of New York Employees' Retirement Fund	*Clerks City of New York Employees' Retirement Fund	College of the City of New York Retirement Fund	*Laborers City of New York Employees' Retirement	Department of Street Cleaning Relief and Pension Fund
222222222222222222222222222222222222222	407 408 408 408 408 408 408 408 408 408 408			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	44.3 117.7 156.2			442			10	:::::::::
	367.2	1,276.2	333.9	1,991.0	604.3	350.5	306.2	236.5	230.2	225.7	56.0	71.3
	Ithough these	cases are techn	*Although these cases are technically disability re	etirements, they	ttirements, they were used as service retirements	ervice retiremen	PČS.					

The total rates shown in the preceding tables, 209 to 212, are brought together in the following table, which gives the rates by cause of separation and expresses them in terms of the number of separations per thousand employees per year.

TABLE 213-STANDARD TOTAL RATES OF SEPARATION EXPRESSED AS NUMBER OF SEPARATIONS PER THOUSAND EMPLOYEES FOR EACH FUND

All Punds

		•	WITHDRAWALS			DEATES			DISABILITY		
DEPARTMENT OR CLASS	Total	Resignations	Dismissale	Total	In Performance of Duty	Other	Total	In Performance of Duty	Other	Total	Service Retirements
Health Department Pension Fund City of New York Employees	86.091	61.937	4.235	66.172	≱18 .	7.001	7.815	o 1 6.	.454	1.394	10.710
Clerks.	80.708 80.324	37.822	10.136	62.581 55.583	::	::	13.482	::	::	2.343	2.302
Mechanics College of the City of New York	67.103	39.071	10.826	49.897	:	:	11.166	;	:	3.675	9.365
Department of Street Cleaning Relief and Pension Fund	58.671	12.072	24.685	38.657	1.234	: 60	6.816	- 44	0.137	0.485	755.5
Police Pension Fund. Fire Department Relief Fund.		4.895	3.958	11.645 8.113	.971	6.33	8.930	1.198	10.28 36.3	8.84 8.84 8.84 8.84	12.762
Women	43.769	;	÷	23.845	:	:	4.902	:	:	3.644	11.288
: .	23.772	:	:	11.007	:	:	6.722	:	;	2.538	3.50\$
	23.772	:	:	11.007	:	:	6.722	:	:	:	6.043
	21.364			13.115	:	:	4.538	:	:	.659	3.062

PN.B.—These rates are those for retirement on pension after 25 years of service in case of disability.

ANNUITY VALUES APPLICABLE TO PENSIONERS

The annuity values applicable to the various classes of pensioners have all been given in the separate sections dealing with individual funds. They are brought together in the following table so that comparisons may be made easily.

TABLE 214—COMPARATIVE ANNUITY VALUES BASED ON MORTALITY TABLES FOR DISABILITY PENSIONERS

MAN	

Age	Teachers' Retirement Fund Women	Police Pension Fund	Teachers' Retirement Fund Men	Health Department Pension Fund	Fire Department Relief Fund	Supreme Court Retirement Fund	Department of Street Cleaning Relief and Pension Fund
20		4.258		7 · 393	1.732		3.796
21		4.518		7.646	r.875		3.828
22		4.816		7.905	2.003		3.864
23		5.153		8.162	2.426		3.901
24		5.534		8.421	2.924		3.938
25		5.951	• • •	8.676	3.699	• • •	3.975
26		6.406		8.929	4.602		4.013
27		6.888	• • •	9.180	5.384	• • •	4.053
28	• • • •	7.384	• • •	9.427	6.013	•	4.096
29		7.875	• • • •	9.667	6.534	• • •	4.140
30		8.358	• • •	9.900	6.971	• • •	4.185
31	• • • •	8.828	• • •	10.127	7.34I	• • •	4.231
32	• • • •	9.276	• • •	10.341	7.657	• • •	4.278
33	• • • •	9.698	• • •	10.545	7.934	• • •	4.329
34		10.089	• • •	10.738	8.175	• • •	4.382
35 36	• • • •	10.447	• • •	10.916	8.387	• • •	4 · 437
30 37	• • • • •	10.767	•••	11.078	8.564	• • •	4 - 497
37 38	l	11.047 11.288	• • • • • • • • • • • • • • • • • • • •	11.223	8.717	• • •	4.557
39	13.751		12.392	11.347	8.848	• • • •	4.619
40	13.621	11.489 11.648	12.224	11.450	8.957		4.683
41	1 - 1	11.765	11.018	11.529	9.047	7.492	4.747 4.814
42	13.349 13.206	11.840	11.916	11.505	9.118 9.172	7.450	4.882
43	13.057	11.878	11.639	11.628	Q.212	7·399 7·342	4.051
44	12.004	11.879	11.510	11.611	9.234	7.287	5.022
45	12.744	11.850	11.386	11.568	0.242	7.223	5.006
46	12.579	11.704	11.272	11.500	9.237	7.156	5.170
47	12.408	11.712	11.155	11.408	9.217	7.000	5.244
48	12.231	11.608	11.036	11.204	9.186	7.013	5.318
49	12.049	11.487	10.913	11.158	0.132	6.934	5.390
50	11.861	11.349	10.787	11.002	g.000	6.852	5.461
51	11.668	11.196	10.654	10.825	8.994	6.770	5.527
52	11.469	11.030	10.515	10.630	8.950	6.684	5.590
53	11.263	10.852	10.367	10.417	8.868	6.592	5.645
54	11.053	10.665	10.209	10.191	8.774	6.516	5.692
55	10.838	10.469	10.041	9.953	8.673	6.442	5.728
56	10.618	10.265	9.861	9.704	8.563	6.366	5.750
57	10.393	10.056	9.667	9.446	8.447	6.303	5.762
58	10.161	9.841	9.458	9.180	8.325	6.253	5.758
59 60	9.926	9.622	9.234	8.909	8.192	6.189	5.739
61	9.688	9.402	8.994	8.632	8.057	6.153	5.706
62	9.445	9.179	8.736	8.355	7.915	6.121	5.656
63	9.200	8.954	8.471	8.076	7.769	6.083	5.588
64	8.951 8.701	8.727	8.199	7.796	7.614	6.066 6.027	5.503
65	8.447	8.499 8.260	7.936 7.686	7.517	7.455		5.399 5.283
3 3	0.447	0.209	7.000	7 - 239	7.336	5.992	3.203

TABLE 214—COMPARATIVE ANNUITY VALUES BASED ON MORTALITY TABLES FOR DISABILITY PENSIONERS—Continued

Age	Teachers' Retirement Fund Women	Police Pension Fund	Teachers' Retirement Fund Men	Health Department Pension Fund	Fire Department Relief Fund	Supreme Court Retirement Fund	Department of Street Cleaning Relief and Pension Fund
66	8.180	8.040	7.452	6.962	7.117	5.041	5.146
67	7.020	7.808	7.220	6.605	6.017	5.869	4.996
68	7.667	7.576	6.088	6.421	6.757	5.810	4.831
69	7.403	7 - 344	6.757	6.150	6.577	5.772	4.655
70	7.137	7.100	6.526	5.870	6.371	5.673	4.468
71	6.860	6.871	6.203	5.600	6.174	5.551	4.276
72	6.600 l	6.633	6.057	5.345	5.977	5.402	4.083
73	6.332	6.380	5.815	5.084	5.771	5.314	3.894
74	6.064	6.143	5.562	4.826	5.558	5.160	3.707
75	5.796	5.892	5.294	4.576	5.357	4.985	3.531
76	5.530	5.635	5.005	4.327	5.133	4.841	3.353
77	5.268	5.374	4.720	4.084	4.021	4.644	3.184
78	5.000	5.104	4.437	3.844	4.670	4.450	3.010
79	4.757	4.828	4.157	3.608	4.471	4.144	2.838
80	4.511	4.546	3.880	3.373	4.234	3.856	2.669
81	4.273	4.256	3.600	3.143	4.027	3.613	2.507
82	4.047	3.962	3.343	2.922	3.827	3.446	2.350
83	3.831	3.665	3.080	2.704	3.58r	3.087	2.200
84	3.627	3.370	2.818	2.493	3.382	2.716	2.056
85	3.430	3.076	2.558	2.285	3.138	2.328	1.916
86	3.239	2.788	2.200	2.086	2.923	1.976	1.785
87	3.057	2.512	2.048	1.891	2.664	1.962	1.655
88	2.883	2.245	1.810	1.708	2.466	1.400	1.541
89	2.715	2.000	1.588	1.545	2.232	1.000	1.436
90	2.549	I.773	1.369	1.400	2.031		1.330
91	2.393	1.560	1.157	1.260	1.787		1.218
92	2.245	1.369	.959	1.131	I.574		1.105
93	2.104	1.188	.804	1.009	1.371		.938
94	1.965	1.023	.652	.826	1.000		.900
95	1.832	.874		.667	.750		• • •
96	1.701	.747					
97	1.582	.600					• • •
98	1.465				• • • •		• • •
99	1.333						
100	1.167						

TABLE 215—COMPARATIVE ANNUITY VALUES BASED ON MORTALITY TABLE FOR SERVICE PENSIONERS

			Clarks						
			City of New York	Mechanica	Tahoran				Denartment
₽ €¢	Teacherr' Retirement Fund Women	Health Department Pension Fund	Employees' Retirement Fund Supreme Court Retirement Fund College of the City of New York Retirement Fund	ork	City E Retir	Teachen' Retirement Fund Men	Fire Department Relief Fund	Police Pension Fund	of Street Cleaning Relief and Pension Fund
35	:	18.108	:	:	:		:	:	:
36	:	17.902	:	:	:	:	:	:	:
37	:	169.41	:	:	:	:	:	:	:
88	:	17.474	:	:	:	:	:	:	:
6 6	:	17.251	:	:	:	:	:	:	:
\$:	17.022	15.801	:	:	:	:	:	:
7	:	16.791	15.583	:	:	:	14.549	:	:
42	:	16.551	15.358	:	:	:	14.240	:	:
4 3	:	16.306	15.128	:	:	:	13.927	:	:
\$:	16.056	14.891	:	:	:	13.611	:	:
45	:	15.799	14.649	14.731	14.748	:	13.291	:	:
\$	14.976	15.534	14.400	14.451	14.485	11.457	12.971	:	:
47	14.757	15.266	14.146	14.201	14.214	11.352	12.646	:	:
\$	14.534	14.992	13.885	13.928	13.936	11.240	12.323	:	:
4	14.306	14.713	13.619	13.651	13.651	11.123	11.999	:	:
22	14.074	14.427	13.348	13.369	13.358	10.996	11.677	:	:
51	13.837	14.137	13.071	13.081	13.060	10.862	11.362	:	:
25	13.594	13.840	12.789	12.787	12.755	10.720	11.054	:	:
S	13.345	13.539	12.503	12.489	12.444	10.568	10.756	:	:
3	13.089	13.234	112.21	12.187	12.128	10.406	10.464	:	:
55	12.826	12.923	11.915	11.877	11.807	10.234	10.187	9.987	:
20	12.556	12.609	11.615	11.566	11.482	10.053	9.933	908.0	:
57	12.277	12.290	11.312	11.251	11.153	9.861	9.676	9.622	:
20 20 30 30 30 30 30 30 30 30 30 30 30 30 30	11.990	11.909	11.005	10.933	10.821	000.6	9.441	9.438	:
60	11.695	11.644	10.696	10.613	10.48 <u>5</u>	9.450	9.226	9.224	:
3	11.392	11.310	10.384	10.291	10.148	9.233	0.00	9.012	7.085
1 9	11.0%	10.987	10.070	6.967	6 8.6	9.00	8.812	8.789	7.454
9	10.761	10.655	9.754	9.643	9.470	8.774	8.600	8.555	7.223
8	10.434	10.321	9.438	9.317	9.130	8.536	8.404	8.311	6.993
t	10.101	9.984	9.121	8.991	8.790	8.291	8.193	8.058	9.761
92	9.763	9.647	8.804	8.666	8.452	8.044	7.976	7.796	6.531
8	9.433	9.300	8.488	8.343	8.116	7.792	7.749	7.524	6.299
67	9.077	8.964	8.173	8.022	7.782	7.539	7.512	7.241	6,069
8	0.732	8.620	7.859	7.701	7.452	7.282	7.267	6.951	5.837
6	0.300	0.275	7.540	7.302	7.127	7.024	7.611	0.050	5.003

-COMPARATIVE ANNUITY VALUES BASED ON MORTALITY TABLE FOR SERVICE PENSIONERS—Continued TABLE 215

	Department of Street Cleaning Relief and Pension Fund	5.373 5.373 6.913	4.686	4.232	3.791	3.368	2.979	2.627	2.403	2.143	862	1.703	1.569	1.416	1.198	1.076	96.	689	.775	.732	:	:		
	Police Penilon Fund	6.359 6.061 5.771	5.49I 5.226	4.736			3.501		8 0 0 0 0 0 0 0 0 0		I. 040 I. 103	1.235	1.120			104	299.	:	:	:	:	:		
	Pire Department Relief Frand	6.744 6.467 6.179	5.881 5.569	5.246	4.563	80.4. 80.4. 80.00	3.114	2.504	2.031	100 T	1.008	1.439	1.208	1.026	.750	:	:	:	•	:	:	:		-
	Teachers' Reidrenest Fund Men	6.764 6.504 6.241			4.880	- '	3.761		2.959		2.225		1.598	1.246		.958	198	.007	:	;	:	:		: :
Punds	Laborers City of New York Employees Retirement Fund	6.807 6.403 6.18S	5.883 5.586			1.880		90.5	2.818	•	2.048 5.048		1.367	• •	791	.632	:	:	:	:	:	:		-
AII N	Mechanics City of New York Employees' Retirement Fund	7.066 6.751 6.444	6.145 5.851	5.504 5.282	5.012	4.490		3.508	3.279	3.85	2.600	2.286	2.112	1.800	1.656	1.515	•	1.257	101.1	1.100	20.0			-
	Chy of New York Retirement Pund			5.758	5.205	4.678	•	3.718	3.499	3.088	2.890	2.530	2.372	2.007		1.796		1.558		1.349	200	1.40		10.
	Health Department Pension Fund	7.930	6.889	6, 199 5, 858	5.523	4.873		3.688	3-423	9.919	2.665	2.244	2.020		1.396	1.184	.967	. 703	605.	:	:	:		
	Teachers' Retirement Fund Women	8.043	7.034	6.389 6.078	5.775	5.194	4.650	4.143	3.904	3.455	3.240	2.856	2.675	2.341	3.188	2.043	1.907	1.778	1.050			2000		200
	Age	70 11 27	27	22	22	28	# £	20	* %	8	6 80	8	88	: 2	8	\$	8	88	2 6	28	25	3 =	102	103

BASIS FOR DERIVING WEIGHTED AVERAGES FOR THE ENTIRE SERVICE, TO BE USED IN COMPARISON WITH FIGURES FOR INDIVIDUAL FUNDS

Comparisons of different funds in respect to the cost of the benefits allowed under them is of much importance in considering the argument that there should be a greater degree of equality among the employees of the different services in the matter of the amount paid by the city to provide pensions for them. Such comparisons are facilitated by working out pension costs, expressed as percentages of salary, for what may be termed the average entrant into the city service as a unit; in other words, figures which show what percentage of salary could be contributed toward pensions in behalf of every new entrant of average age coming into the city service without increasing the liabilities now being incurred, provided the liabilities, in terms of percentages of salary, were the same for all classes of the serv-Such figures give for each type of benefit a single percentage representing the cost of that benefit, in terms of salary, as it is allowed in the city service considered as a unit; and this percentage serves as a standard of cost with which may be contrasted a similar figure representing the cost of the same benefit in any one of the existing funds. These standard costs, in terms of percentage of salary, are presented for each type of benefit in the service as a whole in table 224, on page 415, which also gives comparable figures for each benefit allowed in each of the existing funds. For each specific fund and for the standard or average fund, they relate to entrants coming in to the particular fund at the average age shown by the experience of that fund. Such single figures, showing the costs of the specified benefits as percentages of salaries are the resultants of all the forces upon which the costs of the separate benefits depend. They are not designed to analyze or explain why the cost of a given benefit, in proportion to salary, is twice as great in one fund as it is in the average or standard fund. They merely show that such is the difference, be the cause what it may, and that if equality of costs were to be established without additional liabilities being incurred, changes in the amount of benefit or the conditions upon which the benefit is granted will have to be made in such a way that the costs of that benefit will be reduced by half.

From these standard cost figures, as a starting point, it would be possible to work out for each branch of the service a different combination of conditions and benefits, believed to meet the needs of that branch in so far as they can be met without increasing liabilities, and yet have each fund like every other fund in so far as the costs of all the benefits, as percentages of salary, are concerned. Under such arrangements some funds would receive more than they now receive while others would receive less. This field of work, however, lies beyond the scope of the present report.

The method of deriving the standard costs, in terms of percentages of salaries, was as follows: For each fund the average age at entrance was determined, generally directly from the entrant's column of the actual experience tables for the active service, although in some cases the ages were

weighted in obtaining the averages according to the relative annuity value of future salary when it seemed advisable to make the figures somewhat more conservative. The costs of the pension benefits, expressed as percentages of salaries, were then worked for entrants at the average age for each fund. These figures were used as the average figures for the specified funds. These averages were then weighted according to the amount of the payrolls of the active service of the fund in which they applied and on this basis the weighted averages for the city service as a unit were derived. The standard figure is therefore a weighted average cost of the benefit to an average entrant of the city service, expressed as a percentage of salary. The following table shows the weights employed:

TABLE 216—AVERAGES AND WEIGHTS USED IN PREPARING WEIGHTED AVERAGE VALUES

Department or Class	Average Age of Entrants Nearest Year	Average Entrance Salary	Weight on Basis of Total Payroll	Weight on Basis of Number of Employees
Police Department Pension Fund	26	1,000	. 16487	. 14557
Fire Department Relief Fund	26	1,000	.08168	.06762
School Teachers' Retirement Fund:		.,		•
Men	27	1,134	.06210	.03521
Women	24	762	.25189	. 24273
Health Department Pension Fund:				
Men	31	886	.01052	.01171
Women	32	674	.00344	.00533
College of the City of New York Re-	}			
tirement Fund	31	989	.00526	.00294
City of New York Employees' Retire-			1 1	
ment Fund:		١ .	li	-6
Clerks	30	981	.16499	. 16574 . 08187
Mechanics	34	1,266	.09846	16220
Laborers	39	691	.09669	. 10220
Department of Street Cleaning Relief and Pension Fund	35	800	1	.07325
Supreme Court, First Department,		800	.04927	.0/3-3
Retirement Fund	39	1,816	.00732	.00397
Supreme Court, Second Department,		1,010	.00/32	.00397
Retirement Fund	39	1,816	.00351	.00186
ACCIDENCE A MAG	33	1,510	.55331	
Total			1.00000	1.00000

All Funds

VALUES OF TOTAL BENEFITS AND SALARIES WITH AVERAGE FOR ENTIRE SERVICE

Under the discussion of each class of employees covered by pension is given a table showing the present value of the average total future salaries to be earned and the average present value of the various benefits that may be paid. The following table shows these values for the average entrant into each fund together with corresponding values covering the entire service.

BY ENTERING MEM. TO THESE MEMBERS AVERAGE ENTRANT BERS, AND THE PRESENT VALUES OF THE VARIOUS PENSION BENEFITS PAYABLE RECEIVED VALUES ARE BASED ON THE AGE AND SALARY OF THE TABLE 217—PRESENT VALUE OF AVERAGE TOTAL FUTURE SALARY TO BE INTO EACH FUND—ALL FUNDS AND THEIR FAMILIES.

			Perc	Ричномя то Миники	19288			Total
FUID OF CLASS	Total Future Salary	Total of All Pension Benefits	Total	Upon Service Retirement	Upon Disability Retirement	Total Pensions to Widows	Total Pensions to Children	Pensions to Dependent Parents
Fire Department Relief Fund	\$17,751	\$3,505	\$2,500	\$1,985	\$615	\$820	\$45	940
Touce rension Fund	17,234	2,502	1,927	374	1,553	8 :	35	* :
Supreme Court, First Department, Retirement Fund	27,343	1,186	1,186	1,132	\$\$:	:	:
	14,124	1,019	010'1	847	173	:	:	:
Retirement Fund	27,343	940	946	946	:	:	:	:
and Pension Fund	8,396	216	336	SI	285	346	13	22
rement Fund	14,489	403	492	403	:	:	:	:
	6,396	456	727	371	53	27	*	**3
Women City of Nat Vort Carolonna, Designator City	4,569	314	311	1/2	ę.	:	:	m
Mechanica	12,183	176	176	176	:	:	:	:
Clerks	8,697	101	101	101	:	:	:	:
Laborers	5,168	42	42	43	:	•	:	:
Average Fund	\$12,371	\$883	\$726	\$442	\$285	\$146	*	\$ *

TOTAL OF ACTIVE SERVICE AND PENSION ROLLS

The following tables, which are similar to those given in section II of the report dealing with the individual funds, give the complete active service and pension rolls which have been considered in the valuations:

TABLE 218—NUMBER AND SALARIES OF ACTIVE MEMBERS CLASSIFIED BY AGE WITH ADDITIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO ARE AT OR ABOVE THE INDICATED AGE

A 11	Firm	4

Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above	Age	Number	Salaries	Total Number at Indicated Age or Above	Total Salaries at Indicated Age or Above
15	11	\$3,540	76,906	\$99.206,430	54	1,233	\$1,773,420	9,845	\$13,213,590
16	106	33,830	76,895	99,202,890	55	1,088	1,512,140		11,440,170
17	135	41,290	76,789	99,169,060	56	855			9,928,030
18	171	58,520	76,654	99,127,770		711	1,026,620	6,669	8,712,570
19	200	91,840	76,483	99,069,250		698	902,200		7,685,950
20	496	304,720	76,283	98,977,410		613		5,260	6,783,750
21	848	584,150	75,787	98,672,690		584	759,450	4,647	5,240,720
22	1,377	1,019,070	74.939	98,088,540		482	684,750	4,063	4,555,970
23	1,842	1,484,650	73,562	97,069,470		443	559,920	3,581	3,996,050
24	1,999	1,702,660	71,720	95,584,820		299		3,138 2,839	3,578,860
25	2,277	2,033,890	69,721	93,882,160 91,848,270		392		2,447	3,051,790
26 27	2,295	2,148,410	67,444	89,699,860		313	401,200 433,730	2,134	2.650.500
28	2,274	2,353,290	65,149 62,875	87,346,570	67	332	316,620	1,802	2,216,860
29	2,496 2,587	2,709,950 2,993,450	60,379	84,636,620	68	245 246	320,610	1,557	1.000,240
30	2,507	3,403,570	57,792	81,643,170	69	208	260,400	1,311	1.570,630
31	2,638	3,334,930	54,985	78,239,600	70	264	321,020	1,103	1.301,330
32	2,670	3,422,340	52,347	74,004,670	71	162	204,540	839	080,210
33	2,400	3,248,200	49,677	71,482,330	72	147	168,340	677	775,670
34	2,606	3,564,710	47,277	68,234,130	73	88	96,480	530	607,330
35	2,502	3,506,330	44,671	64,669,420	74	130	162,740	442	510,850
36	2,496	3,525,460	42,169	61,163,000	75	83	100,310	312	348,110
37	2,307	3,350,830	39,673	57,637,630	76	55	62,310	229	247,800
38	8,554	3,721,960	37,366	54,277,800	77	54	63,840	174	185,490 121,650
39	2,191	3,201,740	34,812	50,555,840	78	- 31	35,310	120	86,340
40	2,265	3,395,160	32,621	47,354,100	79	21	22,160	89	64,180
41	2,037	3,154,310	30,356	43,958,940	80	20	19,140	68	45,040
42	2,134	3,224,170	28,319	40,804,630	81	13	12,940	48	32,100
43	1,662	2,532,780	26,185	37,580,460	82	9	7,890	35	24.210
44	1,963	2,993,530	24,523	35,047,680	83	4	3,590	26	20.620
45	1,804	2,708,520	22,560	32,054,150	84	9	7,610	13	13,010
46	1,725	2,650,620	20,756	29,345,630	85	4	3,920		0.000
47	1,550	2,357,100	19,031	26,695,010	86	5	4,510	9)	a c80
48	1,466	2,158,110	17,481	24,337,910	87	1	720	3	a 860
49	1,321	1,976,230	16,015	22,179,800	88 89	•••		3	2.860
50	1,380	1,893,740	14,694	20,203,570	90	2	3,300	ĭ	560
51	1,248	1,854,050	13,314	18,309,830	91	:1	560	ī	560
52	1,156	1,674,760	12,066	16,455,780		I	- 1	1	
53	1,065	1,567,430	10,910	14,781,020	• • •	• • • • • •	••••		

闰 TABLE 219-NUMBER AND SALARIES OF ACTIVE MEMBERS CLASSIFIED BY LENGTH OF SERVICE, WITH ADDI-

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TIONA	TIONAL COLUMNS SHOWIN INDICATED SERVICE OR N	TIONAL COLUMNS SHOWING THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE INDICATED SERVICE OR MORE	G THE TOTAL NUMBER AND SALARIES OF EMPLOYEES WHO HAVE HAD THE	L NUMBER	AND SALA	RIES OF E	MPLOYEES	WHO HAVE	HAD THE
				All Funds	lunde				
Total Service Vears	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More	Total Service Vears	Number	Salaries	Total Number of Employees Having Indicated Service or More	Total Salaries of Employees Having Indicated Service or More
0.	óó' '	\$5,323,420	906'94	\$99,206,430	16	2,487	\$3,749,580	14,477	\$24.593,690
~ €	199,0	0,484,450	916'12	93,883,010	17	1,498	2,400,340	06,11	20,844,110
4 (7	0,039	5,012,090	05,255	87,398,500	9 2	1,920	3,153,400	8,492	16,363,770
•	4,500	5,383,090	54,456	76,720,480	2	908	1,425,810	7,112	12,917,640
'n	3,721	4,196,750	49,956	71,337,390	17	814	1,379,210	6,216	11,491,830
•	4,162	5,224,230	46,235	67,140,640	22	757	1,235,440	2,402	10,112,620
_	5,212	6,723,200	42,073	61,916,410	23	556	1,002,370	4,645	8,877,180
80	4,350	5,348,140	36,861	55,193,210	*	200	988,140	4,089	7,874,810
S	3,900	4,953,010	32,511	49,845,070	22	217	893,320	3,523	6,886,670
9	2,892	3,829,270	28,611	44,892,060	98	442	837,740	3,006	5,993,350
=	3,234	4,483,130	25,719	41,062,790	27	360	707,370	2,564	5,155,610
12	2,646	3,796,650	22,485	36,579,660	8	359	677,340	2,204	4,448,240
13	1,986	3,098,630	19,839	32,783,010	20	267	249,400	1,845	3,770,900
*	1,556	2,415,050	17,853	29,684,380	30 GE	- C. S. S.	2 221 500	1 678	2 221 500
15	1,820	2,675,640	16,297	27,269,330	over	2/61-	2001-1-10	2/61-	3)-1-16
,		-		-					

TABLE 220-NUMBER AND PENSIONS OF EMPLOYEE PENSIONERS CLASSIFIED BY AGE

	Si	ERVICE	Dis	ABILITY		5	SERVICE		DISABILITY
AGE	Num- ber	Pensions	Num- ber	Pensions	AGE	Num- ber	Pensions	Nu	
25			1	\$400	60	104	\$89,380		73 \$48,440
26	l l		1		61	120	96,220		47 31,470
27	l i		l		62	107	86,380) (59 44,640
28	ا ا		2	930	63	94	77,620) [3	25,510
29			4	1,670	64	110	92,490		32,140
30			6	2,000	65	124	08,630		8 28,420
31			4	1,510	66	130	109,360		2 26,150
32		• • •	7	3,300	67	126	101,740		3 32,700
33			8	3,690	68	146	118,060		5 29,710
34			5	2,630	69	145	114,830		4 22,040
35	l		14	8,120	70	126	95,630	3.	2 23.310
36			17	7,510	71	118	95,840	1 20	11,180
37			16	9,330	72	118	95,420	20	11,800
38			10	9,460	73	85	72,800	14	7,840
39	1	\$1,280	28	15,770	74	72	59,200	1 14	11,140
40	1	750	46	27,110	75	68	53,210	17	13,350
41	Ī	450	45	29,330	76	47	37,440	1 12	8,120
42	1	700	53	31,830	77	42	35,990	1 9	6,950
43		3,300	50	32,010	78	31	27,440	1 7	3,020
44	3 6	5,900	73	46,700	79	21	16,410	8	5,690
45	12	10,500	60	48,180	80	21	15,800	1 2	3,200
46	13	17,270	78	49,510	81	22	18,730	1 1	390
47	25	27,830	108	73,610	82	10	0,490	3	1,700
48	21	10,840	112	80,010	83	11	16,390	5	3,070
49	27	26,210	90	63,310	84	9	7,610	l	
50	24	22,750	106	75,300	85	5	3,810	2	900
51	42	43,710	140	99,840	86	1 1	1,500		l
52	51	41,430	174	129,070	87	1	600	1	1,380
53	72	66,050	157	112,440	88	ī	600	2	391
54	55	47,740	149	107,600	89	;	600	1	1,000
55	78	65,400	145	110,250	90	2	1,510		
56	105	89,720	127	91,840	91	li	1,500		(
57	106	85,800	102	71,320		ı •	-,,,,,,,		
58	117	96,000	91	68,470	ll .				0
59	90	77,680	71	50,920	Total	2.870	\$2,402,630	2.788	\$1,902,871
30	90	1 ,,,555	٠٠ ا	33,920	- Star	-,5,5	V-,401,030	-,,	

TABLE 221—NUMBER AND PENSION OF CHILDREN, WILLUWS ALL CENTRAL CLASSIFIED BY AGE

Number Penalous Aye Number Penalous Penalous Number Penalous Penalou	CHE	CHILDREN PENSIONERS	NEES	B	Widow Pensionees	EES	Depender Pensi	DEPENDENT PARENT PENSIONERS	¥C#	Winow P	Widow Pensioners	Depender Pensi	DEPENDENT PARENT PENSIONERS
Total State of the control of the co	Age	Number	Pensions	Age	Number	Pensions	Number	Pensions		Number	Pensions	Number	Pensions
3 1500 276 5 1500 276 1500 276 1500 276 1500 276 1500 276 277 </td <td>-</td> <td>:</td> <td>:</td> <td>25</td> <td>н</td> <td>\$600</td> <td>:</td> <td>:</td> <th>ន</th> <td>5.5</td> <td>\$16,940</td> <td>~</td> <td>∞9\$</td>	-	:	:	25	н	\$600	:	:	ន	5.5	\$16,940	~	∞9 \$
3 1 150 27 5 1,800 1,600 15,600<	8	"	\$220	56	:	:	:	:	\$	89	20,420	:	:
4 3 370 28 6 4,80 6 4,90 6 4,90 6 4,90 6 4,90 6 4,90 6 4,90 6 4,90 6 4,90 6 4,90 6 4,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90 6 4,90 11,90	m		150	27	S	1,800	:	:	9	26	069'91	٣	1,100
5 6 6	+	m	370	58	9	2,800	:	:	9	6	15,050	*	1,400
7 5 5 6 30 11 3,700 68 42 133,700 9 7 600 33 21 1,740 30 4,500 40 42 133,700 10 12 2,000 33 21 7,400 77 10 38 13,500 11 15 2,200 34 27 5,500 77 40 11,500 11,500 113 17 2,200 37 20 77 40 11,500 <td>S</td> <td>~</td> <td>430</td> <td>50</td> <td>œ</td> <td>3,800</td> <td>:</td> <td>:</td> <th>67</th> <td>43</td> <td>12,220</td> <td>٣</td> <td>1,100</td>	S	~	430	50	œ	3,800	:	:	67	43	12,220	٣	1,100
4 6000 33 111 7,4000 70 36 42 112,600	9	S	580	30	11	3,700	:	:	89	46	13,700		300
8 6 86 32 21 7,400 70 38 12,550 10 12 2,000 34 24 9,600 77 36 11,800 11 12 2,200 35 12 9,600 77 37 24 11,800 12 1,700 36 12 9,600 77 37 24 6,300 11,800	7	4	8	31	11	00,4	:	:	69	42	12,600	-	8
10	∞	•	989	32	21	7,400	:	:	2	38	12,550	~	8
10 12 2,010 34 27 6,500 77 72 40 11,800 11,8	0	_	810	8	72	9,060	:	:	77	38	8,250	•	9
11 15 1,720 35 16 8,840	9	12	2,010	*	27	9,500	:	:	72	Q	11,800	•	9
13 17 2,270 36 28 8,880 74 30 8,880 77 30 8,880 77 31 6,300 10 10 10 10 6,300 10 10 10 6,300 10 10 6,300 10 10 10 10 10 10 10 10 10 10 10 10 10	=	15	1,720	35	61	5,400	:	:	73	23	6,740	:	:
13 14 2.240 37 31 10,040 75 21 6,300 15 2.240 37 31 10,040 77 76 19 5,300 16 2.350 44 15,300 47 15,040 77 9 2,700 3,000 17 16 2.100 41 47 15,040 77 9 2,700 3,000 18 17 2,100 42 16,760 79 10 3,000 3,000 3,000 18 17 13,800 16,760 17 16,760 17 17,200 17,300 3,000	12	17	2,270	36	78 82	8,880	:	:	7.	30	8,820	٣	850
14 20 4,510 38 29 9,650 76 19 5,380 16 28 4,390 40 47 15,380 77 9 2,400 18 17 2,100 41 47 15,380 78 10 2,400 18 17 2,100 42 42 43 42 13,800 79 10 2,400 18 17 18 18 18 18 19 10 2,400 18 17 18,380 82 1,300 3,000 <td< td=""><td>13</td><td>7</td><td>2,240</td><td>37</td><td>31</td><td>10,040</td><td>:</td><td>:</td><th>75</th><td>21</td><td>6,300</td><td>8</td><td>1,100</td></td<>	13	7	2,240	37	31	10,040	:	:	75	21	6,300	8	1,100
15 28 4,300 44 15,200	*	50	4,510	38	50	9,650	:	:	92	61	5,380	~	8
28 4,390 40 47 15,640 78 10 3,000 17 2,120 41 47 15,800 81 4 1,200 43 42 15,800 81 4 1,300 44 52 15,700 82 5 1,300 45 61 18,700 88	15	27	5,390	33	\$	15,200	:	:	77	0	2,700	~	8
10 2,120 41 47 13,800 19 10 2,120 42 42 42 42 42 42 42 42 42 42 42 42 42	91	28	4,390	\$	47	15,640	:	:	78	2	3,000	:	:
17 2,100 42 16,760 8 2,400 10 43 42 16,760 8 8 2,400 10 44 52 16,760 8 8 1,300 10 45 63 16,760 8 8 1,300 11 10 16,600 8 8 1,300 11 10 16,600 8 8 1,300 12 10 10,600 8 8 1,300 13 10 10 10 10 10 14 10 10 10 10 10 10 15 10 <td>17</td> <td>91</td> <td>2,120</td> <td>4</td> <td>47</td> <td>13,800</td> <td>:</td> <td>:</td> <th>79</th> <td>2</td> <td>3,030</td> <td>H</td> <td>38</td>	17	9 1	2,120	4	47	13,800	:	:	79	2	3,030	H	38
43 42 13,880 81 4 1,300 44 52 16,300 82 15,300 45 65 19,000 82 15,300 46 61 18,700 88 1 1,300 51 62 18,700 88 1 1,300 52 18,000 88 1 1,300 53 62 18,000 88 1 1 3,000 54 85 53 65 18,000 88 1 1 3,000 55 55 55 55 17,800 94 55 65 65 17,800 94 55 65 65 17,800 94 55 65 65 17,800 94 55 65 65 17,800 94 55 65 65 17,800 94 55 65 65 17,800 94 55 65 65 17,800 94 55 65 65 17,800 94 55 65 65 17,800 96 56 65 17,800 96 57 65 18,000 96 58 65 17,800 96 59 7 120	18	17	2,180	42	55	16,760	:	:	8	90	2,400	:	:
44 \$2 16,300 1,380 1,380 1,380 1,380 1,380 1,380 1,380 1,380 1,380 1,380 1,30	:	:	:	43	42	13,880	:	:	6	4	1,200	64	8
45 63 19,000 84 5 1,500 84 6 6 1 1,500 84 6 6 1 1,500 84 7 1 1 21,000 85 5 5 1,320 85 6 2 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1 1,320 85 8 1,320 85 8 1 1,320 85 8	:	:	:	4:	52	16,300	:	:	87	v	1,380	"	8
40 01 18,700 84 3 900 47 75 16,086 85 5 1,320 49 62 18,720 86 300 50 70 20,200 87 300 51 65 18,720 89 300 52 65 18,000 89 300 53 65 18,000 90 600 54 85 26,020 90 600 55 53 15,000 94 55 54 85 16,400 95 55 55 15,000 94 55 55 15,000 95 <	:	:	:	45	63	009,61	:	:	2	S	1,500	H	38
47 59 18,080 15,320 <td< td=""><td>:</td><td>:</td><td>:</td><td>\$:</td><td>10</td><td>18,700</td><td>:</td><td>:</td><th>\$ 2</th><td>80</td><td>8</td><td>:</td><td>:</td></td<>	:	:	:	\$:	10	18,700	:	:	\$ 2	80	8	:	:
46 71 21,020 80	:	:	:	41	20	18,080	:	:	82	v	1,320	a	8
100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	:	:	:	\$ 4	1/	21,020	:	:	8 8	: '		:	:
5.1 65 18,000 899 1 300 5.2 65 18,680 2 4,000 5.3 62 18,680 1 4,000 5.4 68 17,880 996 5.5 68 17,880 996 5.6 69 17,880 996 5.7 68 17,800 2 380 997 5.8 17,800 5 1,480 998 5.9 5.9 5.9 5.9 5.9 5.9 5.9 5.9 5.9 5.9	:	:	:	Ž.	00	18,720	:	:	6	⊢ (300	:	:
5.5	:	:	:	2.5	2,2	20,200	:	:	88	.	380	:	:
5.5 5.3 6.2 15,000 2 4,780 91 2 5.5 5.5 5.3 15,000 1 400 92 2 5.5 5.5 5.3 15,000 1 400 92 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	:	:	:	7.5	S	10,000	:	:	8 8	- ·	8 6	:	:
54 85 15,600 I 400 93 55 55 53 15,600 I 400 93 56 62 17,880 57 48 14,400 58 49 15,380 2 380 97 60 53 15,400 5 1,480 98 61 68 19,920 I 500 99 I 120	:	:	:	2 2 2		20,500	: •		2 2	N	3	:•	: 8
55 53 15,600 1 400 93 95 55 53 15,600 1 1,880 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95	:	:	:	3.2		20,00	•	3 6	18	:	:	•	}
56 62 17,880 94 95	: :	•	•	25.	3 5	200		3 8	8	•	:	:	
57 48 14,400 95 95 58 49 15,380 2 900 96 59 58 17,800 2 380 97 50 59 58 17,800 5 1,480 98 120 50 50 50 50 50 50 50 50 50 50 50 50 50	; ;			92	5.50	17.880	• ;	}	3			: :	
58 49 15,380 2 900 96 59 58 17,800 2 380 97 60 53 15,400 5 1,480 98 61 68 19,920 1 500 99 1 120 62 42 13,000 63 468,720	: :	: :	: :	57	87	14,400	: :	: :	6	: :		: :	
59 58 17,800 2 380 97 60 53 15,400 5 1,480 98 120 61 68 19,920 I 500 99 I 120 100 100 100 100 100 100 100 100 100	:	:		28	9	15,380	. "	8	8	:		:	:
60 53 15,400 5 1,480 98 61 68 19,920 1 500 99 1 120 62 42 13,000 100 42 13,000 42 42 13,000 42 42 42 42 42 42 42 42 42 42 42 42 42	:	:	:	29		17,800	8	380	6	:	:	:	:
61 68 19,920 I 500 99 I 120 62 42 13,000 100 42 13,000 42 13,000 42 13,000 4686.120	:	:	:	8	53	15,400	v	1,480	86	:	:	:	:
302 \$50.580 100 100 42 13,000 468 F 120	:	:	:	61	89	19,920	н	88	8	н	120	:	:
303 \$50.080	:	:		62	43	13,000	•		100	•		:	• • •
	Total	202	\$10.580	_ :	:		:			2.226	\$685.120	53	\$17.700

VALUATION BALANCE SHEET COVERING ALL

The following valuation balance sheet represents a consolidation of all shows the total assets and liabilities of all the pension funds combined:

TABLE 222—A VALUATION OF ASSETS AND LIABILITIES OF YORK—VALUED AS

Liabilities	•
Item	Present Value of Payments to be Made
Pensions to 8,139 Pensioners now on the pension rolls of the fund as follows:	5
Service Pensionera:	<u> </u>
2,870 Annual pensions aggregating \$2,402,630	\$21,187,291
Disability Pensioners: 2,788 Annual pensions aggregating	18,680,181
Widow Pensioners:	10,000,101
2,226 Annual pensions aggregating 685,120	7,985,698
Children Pensioners:	
202 Annual pensions aggregating 30,580 Dependent Parent Pensioners:	124,033
53 Annual pensions aggregating 17,790	142,773
Total Pensions Entered Upon	\$48,119,976
Pensions to Dependents of present pensioners:	
Widows' Pensions:	
Widows of Service Pensioners	
Widows of Disability Pensioners	3,098,020
Children's Pensions: Children of Service Pensioners	24,043
Children of Disability Pensioners	08,646
Total Prospective Pensions to Dependents of Present	
Pensioners	\$4,831,732
Pensions to such Employees as will retire from the present active force of	
76,906 employees:	
Service Pensions	\$98,296,775
Disability Pensions, on account of: Actual Performance of Duty	919,437
**Other Causes	43,593,126
Total Prospective Pensions to Employees	\$142,809,338
Pensions to Dependents of such employees of the present active force as will die in service or while on pension:	
Widows' Pensions:	
Widows of employees who will die in Performance of Duty Widows of employees who will die from Other Causes in	\$1,105,767
Service	5,714,625
Widows of employees who will die on Disability Pension	4,431,845 7,592,055
Children's Pensions:	7,392,033
Children of employees who will die in Performance of Duty	51,748
Children of employees who will die from Other Causes	276,329
Children of employees who will die on Service Pension Children of employees who will die on Disability Pension	92,897 258,815
Dependent Parents Pensions:	250,013
Parents of employees who will die in Performance of Duty	60,554
Parents of employees who will die from Other Causes in	
Service	174,732
Total Prospective Pensions to Dependents of Employees in Service	\$19,759,367
Total Pensions Not Entered Upon	\$167.400.427
Grand Total	
Grand I Viai	A-13,344,3

^{**}Note—The liability for disability pension in funds not having special provisions covering disability in actual performance of duty has been included in this item.

FUNDS

the individual balance sheets shown throughout this report, and consequently

THE COMBINED PENSION FUNDS OF THE CITY OF NEW OF JUNE 30, 1914

Assets	
Item	Present Value of Payments to be Received
Funds in hand	\$6,849,653 8,895,192 202,775,568
·	
Grand Total	Save con and

Nors—There is no definite basis for estimating the portion of this deficiency which may be covered by the continuance in the future of the present indirect contributions from the City and other sources. The amount which can be credited to the present employees and pensioners, however, will probably be less than \$sp,629,500.

The following table shows the estimated amount of appropriation which or revocation of pension. This table does not take into account the interest as the pensions become payable. It simply shows the actual payments which to persons now on the roll; that is, present pensioners.

TABLE 223—AGGREGATE AND DETAILED ANNUAL COST

All

Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total
0	1014	\$1,849,268	\$2,334,584	\$674,942	\$29,479	\$17,187	\$4,905,460
1	1915	1,751,507	2,212,812	652,570	26,227	16,071	4,659,187
2	1916	1,660,273	2,092,494	630,448	21,790	14,793	4,419,798
3	1917	1,573,702	1,973,363	608,394	16,391	13,957	4,185,807
4	1918	1,491,246	1,856,043	586,381	11,388	12,945	3,958,003
5	1919	1,412,380	1,737,143	564,658	9,620	11,974	3,735,775
6	1920	1,336,878	1,627,417	543,003	7,388	11,047	3,525,733
7	1921	1,264,406	1,516,884	521,496	5,681	10,166	3,318,633
8	1922	1,194,768	1,409,245	499,218	3,705	9,329	3,116,265
9	1923	1,127,588	1,304,600	479,161	2,908	8,534	2,922,791
10	1924	1,061,750	1,204,209	459,332	2,242	7,777	2,735,310
11	1925	999,894	1,107,190	437,757	1,659	7,060	2,553,560
12	1926	939,646	1,015,163	417,362	1,099	6,384	2,379,654
13	1927	899,431	925,309	397,494	697	5,752	2,228,683
14	1928	825,091	840,841	377,861	346	5,161	2,049,300
15	1929	770,834	741,761	359,413	204	4,616	1,876,828
16	1930	718,261	669,931	339,745	• • •	4,116	1,732,053
17	1931	668,528	603,163	321,291	• • •	3,657	1,596,639
18	1932	619,392	520,930	303,274	• • •	3,234	1,446,830
19 20	1933	572,711	483,142	284,914	• • • •	2,844	1,343,611
	1934	528,008	440,421	268,757	• • • •	2,485	1,239,761
21 22	1935	485,385	380,482	252,077	• • • •	2,158	1,120,102
23	1936	444,572	334,925	236,039	• • • •	1,867	1,017,403
23	1937	405,665	293,061	220,573	• : •	1,607	920,906 830,486
25	1938	368,673	254,826	205,612	•••	1,375	746,115
26	1939	333,567	220,142 188,808	191,237	• • • •	1,169	667,596
27	1940	300,355	160,604	177,449	• • • •	984 824	
28	1941	268,968 239,460	135,366	164,261 151,647	• • • •	682	594,657 527,155
29	1942	239,400	133,300	130,622	• • • •		464,837
30	1943	185,895	93,197	139,022	• • • •	559	407,753
31	1944 1945	161,003	76,068	117,204	• • • •	453 365	355,630
32	1945	139,778	61,361	107,117	• • • •	201	308,547
33	1940	119,561	48,886	97,448	• • • •	230	266,125
34	1947	100,673	38,434	88,393		180	227,680
35	1940	84,011	20,764	79,892	• • •	137	194,704
36	1949	70,568	22,668	79,892	• • • •	101	165,296
37	1951	57,887	16,965	64,569		73	139,494
٠,	-43-	37,007	20,903	04,309	• • • •	/3	- דעדוענ

^{*}Date—Year beginning July 1st.

will be required to continue the pensions of present pensioners until death factor as it does not affect the appropriation if the amounts are appropriated are represented in the balance sheet by the present value of future pensions

OF PENSIONS TO PERSONS ON THE PENSION ROLL

77.		4-
	m	пв

Year After Valuation	*Date	Disability Pensions	Service Pensions	Pensions to Widows	Pensions to Children	Pensions to Dependent Parents	Total
38	1952	\$47,101	\$12,456	\$57,708		\$52	\$117,317
39	1953	37,948	8,971	51,347	• • •	36	98,302
40	1954	30,281	6,344	45,512	• • •	26	82,163
41	1955	23,960	4,406	40,136	• • •	16	68,518
42	1956	18,772	3,016	35,227		9	57,024
43	1957	14,588	2,038	30,760		4	47,390
44	1958	11,241	1,355	26,729	• • •	2	39,327
45	1959	8,573	890	23,093	• • • •	• • •	32,556
46	1960	6,880	582	19,847	• • •	• • •	27,309
47	1961	4,865	382	16,952	• • •	• • •	22,199
48	1962	3,603	235	14,381	• • •		18,219
49	1963	2,645	154	12,124	• • •		14,923
50	1964	1,919	101	10,153	• • • •	·	12,173
51	1965	1,379	60	8,358	• • •		9,797
52	1966	980	38	6,957	• • •	• • • •	7,975
53	1967	692	23	5,684	• • • •		6,399
54	1968	483	13	4,598	• • •		5,094
55	1969	338	6	3,676		• • •	4,020
56	1970	233	2	2,907		• • • •	3,142
57	1971	151	I	2,280		•••	2,432
58	1972	107	• • • •	1,765	• • •		1,872
59	1973	69	• • •	I,345			1,414
60	1974	42	• • •	1,011	• • •	• • • •	1,053
61	1975	26	• • •	747			773
62	1976	16		537	• • • •		553
63	1977	8		369	• • • •		377
64	1978	3	• • •	244	• • •		247
65	1979	1	•	158			159
66	1980		• • • •	96	• • •		96
67	1981			54	• • •		54
68	1982			29	• • •		29
69	1983			13			13
70	1984		• • •	5	• • •	• • • •	5
71	1985		• • •	2	• • •	}	2
72	1986	• • • •	•••	1	• • •	• • • •	ı
Tota	al	\$27,462,142	\$29,126,166	\$12,645,673	\$140,824	\$192,289	\$69,567,094

PERCENTAGES OF SALARIES REQUIRED TO PAY PENSIONS TO FUTURE ENTRANTS WITH AVERAGES FOR ENTIRE SERVICE

Under the discussion of each class of employees covered by pension is given a table showing for each age of entrance the cost of the benefits allowed to them, expressed as a percentage of salary paid. The following table shows the percentages for each fund according to the average age of entrants into the fund, together with corresponding percentages covering the entire service:

TABLE 224—RATES OF CONTRIBUTION EXPRESSED AS PERCENTAGES OF SALARIES FOR THE AVERAGE AGE

AT ENTRANCE INTO EACH FUND

			4	ENSION	PENSION TO EMPLOYEES	ress		Pens	ON 10	PENSION TO WIDOWS	80	U	PENSION 1 CHILDREN	5 X		PER	PENSION TO DEPENDENT PARENTS OF	25.
	Str		-		DISABILITY	Y PENSIONS			ACTIVES	824	25		ACTIV	22	251	-	Acr	25
	ojsu	su	noi		In Per-		Not IN		DYING	ō	nlv(DYING	u	aivo		DYING	g Ì
FUND OR CLASS	•्य ॥	oiens	Pens		DOEMANCE OF DUTY		PERFORMANCE OF DUTY		nça		I ens		nça	30	I ens		nca -w	net Test Er
	A latoT	Total P	Service	latoT	No Limita- tion	With Service of Less Than 10 Years	With Service of 10 Years or More	InsoT	oragal Dispersion	Not In I formance Vaucy	Pension	LatoT	In Perior Since of D	formannor Yau CI	Pension	LatoT	In Perior	From Ot Causes A 10 Year
Fire Department Relief Fund	19.73	14.64	11.17		7,	.35	88.5	4.62	.75	1.25	2.62	.25	So.	8,		22.0	8:	91.
Department of Street Cleaning	4.99	2.11	2.10	20.0	.52	:	9.50	3.03	/1:	02:1	61.2	4.	 5	 8	 6.	<u>.</u>	<u>. </u>	:
Relief and Pension Fund	8.55	4.02	19:	3.41	8	:	3.35	4.12	99.	1.27	2.19	.15	٠٥	so.	.07	.36	ဇွ	. 23
Men. Teacher' Retirement Fund:	7.36	6.68	5.81	.87	.73	:	.15	.58	:	:	:	\$	ş.	:	:	8	8	:
Women.	7.17	7.17	5.95	I.22	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Women.	6.89	6.83	5.92	16.	7.	:	.17	:	:	:	:	:	:	:	:	8	8	:
Supreme Court, First Department, Retirement Fund	4.64	4.64	4.43	. 32	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Men Court Ground Description	4.13	4.13	3.69	‡	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	3.46	3.46	3.46	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Emple	3.40	3.40	3.40	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Mechanics	1.43	1.43	1.43	:	:	:	:	:	:	;	:	:	:	:	:		:	:
Laborers	. &	8	8.	: :	::	::	::	::	::	::	: :	::		: :		: :	: :	::
Average Fund	7.14	5.87	3.57	2.30	:	:	:	1.18	:	:	:	9.	:	:	:	9.	:	:



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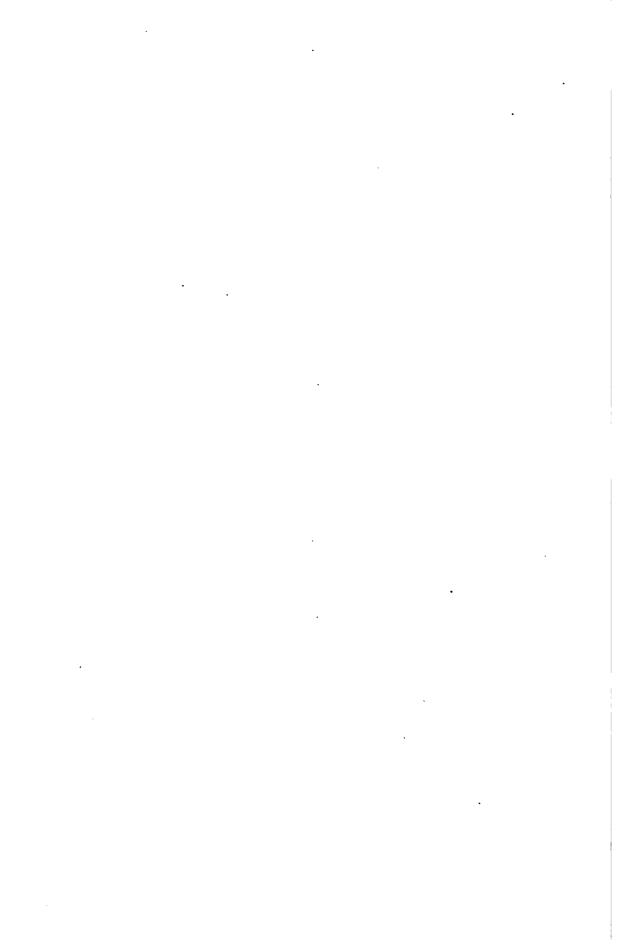
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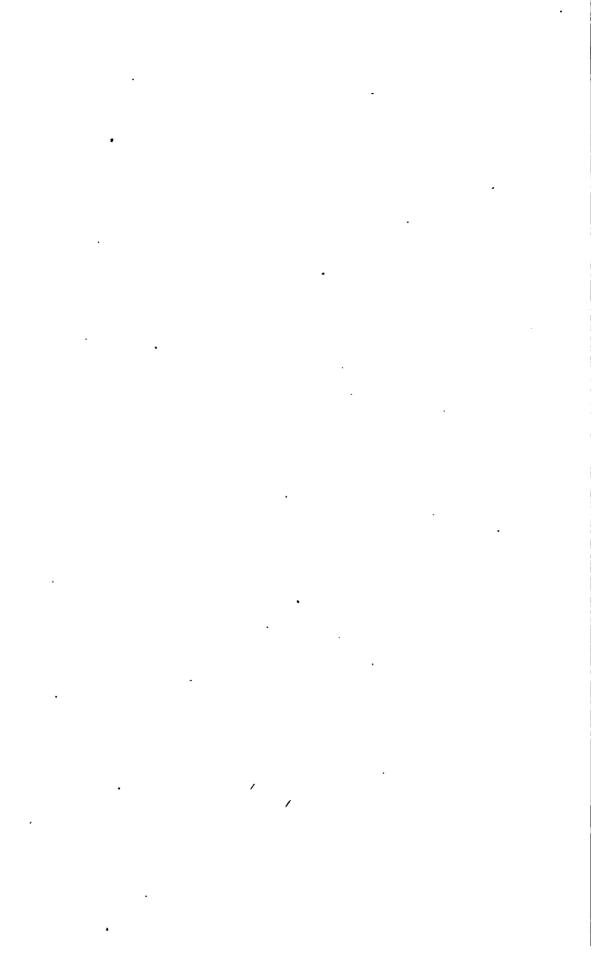
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